

ARI Research Note 2007-06

**Annotated Bibliography: Research on Enlisted
Attrition in the U.S. Army**

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July 2007

**United States Army Research Institute
for the Behavioral and Social Sciences**

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REPORT DOCUMENTATION PAGE

1. REPORT DATE (dd-mm-yy) July 2007		2. REPORT TYPE Final		3. DATES COVERED (from...to) February 2005 – May 2007	
4. TITLE AND SUBTITLE Annotated Bibliography: Research on Enlisted Attrition in the U.S. Army				5a. CONTRACT OR GRANT NUMBER	
				5b. PROGRAM ELEMENT NUMBER 665801	
6. AUTHOR(S) Elyse Jennings (Universtiy of Maryland), and Nehama Babin (U.S. Army Research Institute)				5c. PROJECT NUMBER MM15	
				5d. TASK NUMBER	
				5e. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Department of Sociology U.S. Army Research Institute University of Maryland Attn: DAPE-ARI-ZA College Park, MD 20742 2511 Jefferson Davis Highway Arlington, VA 22202-3926				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Institute for the Behavioral and Social Sciences 2511 Jefferson Davis Highway Arlington, VA 22202-3926				10. MONITOR ACRONYM ARI	
				11. MONITOR REPORT NUMBER ARI Research Note 2007-06	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.					
13. SUPPLEMENTARY NOTES Subject Matter POC: Nehama Babin					
14. ABSTRACT (<i>Maximum 200 words</i>): The purpose of this annotated bibliography is to provide a resource for the study of Soldier attrition, with a focus on the Active enlisted component of the U.S. Army. These annotations include descriptions of the published literature on attrition from 1980 through the present. This annotated bibliography is intended to gather the many research efforts that have been conducted over the years into a single source. This source may provide a base for those who are continuing ongoing research or are beginning new attrition research. It can be used as an overview of methods and statistics utilized over the years, or a summary of the findings and results of the many pieces of research. The primary focus of this bibliography is on enlisted attrition in the Active component of the U.S. Army. Bibliographic references to research or literature on the Army Officer Corps and the Reserve Component (including the Army National Guard) were not included. Each component of the Army has its own unique structure, standard, and policies, and therefore, it cannot necessarily be assumed that attrition models of one component are easily transferable to or generalized to another. Furthermore, each component of the Army has its own set of complexities that make generalization risky.					
15. SUBJECT TERMS Soldier attrition, enlisted attrition, active duty, the All-Volunteer Force, research on Solder attrition.					
SECURITY CLASSIFICATION OF			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON
16. REPORT Unclassified	17. ABSTRACT Unclassified	18. THIS PAGE Unclassified			
			Unlimited		Ellen Kinzer Technical Publication Specialist 703/602-8047

ANNOTATED BIBLIOGRAPHY: RESEARCH ON ENLISTED ATTRITION IN THE U.S. ARMY

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INTRODUCTION

The purpose of this annotated bibliography is to provide a resource for the study of Soldier attrition, with a focus on the Active enlisted component of the U.S. Army. These annotations include descriptions of the published literature on attrition from the year 1980 through the present.

The issue of enlisted attrition has been a constant focus in the military since the advent of the All-Volunteer Force (AVF) and a large amount of research has attempted to define, measure, and uncover contributing factors related to attrition. This research is often focused on the goal of determining the kinds of methods, strategies, and interventions that might be developed to help manage attrition. The problem of Soldier attrition is complex and multi-faceted and has had a significant impact on force readiness and stability. It has many causes and emerges in many distinct contexts and environments, making a solution difficult to come by. Attrition cannot be fixed easily; there seems to be no panacea either to eliminate or to reduce attrition.

Since the advent of the AVF in 1973, researchers have made enlisted Soldier attrition one of their major topics of study and have left in their wake a great number of both qualitative and quantitative reports, studies, and papers. Each of these has offered new models and variables, and makes great efforts to explain the numerous factors contributing to attrition with the anticipation that these findings might contribute to or translate into policy recommendations. This research is extremely valuable for the Army for several reasons. First, the research contains information for Army leaders to assist in improving the overall enlisted management systems as well as Soldier selection processes and procedures. Additionally, the research is useful to aid in providing the American Soldiers with a valuable experience and opportunity while serving their country, and to strengthen military readiness, which will ultimately reduce military costs. Finally, the Iraq War and ever-increasing need for Soldiers makes retention that much more important. Without a draft Soldier retention is critical to the war effort.

This annotated bibliography is intended to gather the many research efforts that have been conducted over the years into a single source. This source may provide a base for those who are continuing ongoing research or are beginning new attrition research. It can be used as an overview of methods and statistics utilized over the years, or a summary of the findings and results of the many pieces of research.

Because the area of military attrition is so broad and attrition research is so prolific, parameters were established to define the focus of this bibliography. The bibliography includes attrition research available from 1980 to the present, spanning most of the life of the AVF which began in 1973. The year 1980 was chosen because the literature search revealed that very little work on attrition existed before that point. By 1980 the

AVF had been in existence for a sufficient number of years so that the attrition issue (or challenge) was beginning to emerge.

The primary focus of this bibliography is on enlisted attrition in the Active component of the U.S. Army. Bibliographic references to research or literature on the Army Officer Corps, the Reserve Component, and the Army National Guard were not included. Each component of the Army has its own unique structure, standard, and policies, and therefore, it cannot necessarily be assumed that attrition models of one component are easily transferable to or generalized to another. Each component of the Army has its own set of complexities that make generalization risky.

This bibliography also only concentrates on the Army and omits the other services (e.g., Navy, Marines, Air Force). Because a large body of research on Army attrition exists, it was considered prudent to concentrate on that alone. Additionally, attrition in other services may not follow the same patterns as that in the Army. However, there are a few research items that were retrieved and included in this bibliography profile that discuss the military as a single organization, sometimes comparing attrition across services and sometimes discussing attrition as a general military issue. When including these research items, our annotations focus specifically on any references to the Active Army and Army enlisted attrition.

This bibliography also excluded cross-national studies or attrition studies on armies of other countries. Although cross-national research is, undoubtedly, beneficial and enriching, it was the intent of the authors to be as comprehensive and complete as possible in its coverage of attrition research in the U.S. Army before moving to or including other country comparisons.

Finally, the annotated portion of this bibliography only includes published research documents, reports, books, and journal articles. Published items have undergone review and represent legitimate and recognized research efforts. It was believed that the users of the bibliography would be best served by a collection of published items. Nonetheless, following the annotated portion of the bibliography, there is a list of references of conference presentations, doctoral dissertations, and other unpublished reports. In addition, there is a section containing General Accounting Office (GAO) documents that, for the most part, represent testimony before Congress on the problem of attrition in the Army, specifically, and other services, generally. A brief description has been provided for these documents.

THE SIGNIFICANCE OF ATTRITION

In 1980 the GAO reported to Congress that "...attrition of first-term enlisted personnel – their separation from service before completion of their tours – has become a serious and costly problem for the All-Volunteer Force."² This report attributed attrition to

² United States General Accounting Office. (1980). *Attrition in the military- an issue needing management attention: Report to Congress* (GAO/FPCD-80-10). Washington, DC: United States General Accounting Office.

changes in the military environment and changes in policy that allowed easier discharges for sub-standard performance or disciplinary problems. According to a 1998 GAO report, between Fiscal Year (FY) 1982 and FY 1993, 31.7% of all enlistees across

² United States General Accounting Office. (1980). *Attrition in the military- an issue needing management attention: Report to Congress* (GAO/FPCD-80-10). Washington, DC: United States General Accounting Office.

Services did not complete their first terms of service. For the Army, Navy, and Air Force enlistees who entered the services in FY 1993, attrition rates were higher than they had been in over a decade. Furthermore, first-term attrition is costly: the services' recruiting and training investment in each enlistee during the first term was estimated to be on average \$35,532. Therefore, using fiscal year 1993 estimates, GAO calculated that the services spent \$1.3 billion on the 72,670 enlistees who entered the services in FY 1993 and departed prematurely.³

As a military organization is significant to the welfare of a country, it must maintain specified personnel strength limits in order to function appropriately. Manning the force is one of the most important factors in military readiness and security strategy.⁴ By its nature, any volunteer organization will have a flow of people both in and out of it. But a military organization will need to maintain a certain level of stability and retention of its Soldiers in order to carry out its mission and maintain readiness.

DEFINITION OF ATTRITION

Attrition is the premature separation of a Soldier from service, or separation before the service obligation is completed. It is not necessarily equivalent to retention or reenlistment. Retention usually refers to maintaining the number of Soldiers, whether it is within the first service obligation or after the reenlistment decision. Reenlistment, similar to retention, is the act of a Soldier "signing up" to serve again after a first obligation or to lengthen a current obligation.

Furthermore, attrition cannot be categorized simply as the act of leaving the Army. There are different types of attrition. *Project First Term (A Longitudinal Study of First Term Attrition and Reenlistment among FY 1999 Enlisted Accessions)*⁵ conducted one of the most complete analyses on attrition, analyzing types of attrition (e.g., attrition for medical, behavioral, and performance reasons), and reasons contributing to those types of attrition. The research also identified both positive and negative attrition. It is important to note that attrition falls into several categories.⁶ Some attrition occurs when

³ United States General Accounting Office. (1998). *Military attrition: Better data, coupled with policy changes could help the services reduce early separations* (GAO/NSIAD-98-213). Washington, DC: Gebicke, M.E. (AD A354 034)

⁴ Hickman, S.B. Colonel. (2003). *Army enlisted attrition: Where are we and where do we go from here? - Strategy Research Project*. Carlisle Barracks, PA: U.S. Army War College. (AD A414 081)

⁵ Strickland, William J. Ed., (2005). *A longitudinal examination of First-Term Attrition and Reenlistment among FY1999 Enlisted Accessions* (ARI Technical Report 1172). Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences (AD A448 564).

⁶ Ramsberger and Babin, in progress. *Recent ARI Research on Enlisted Attrition from the U.S. Army*. ARI Special Report.

the fit between the Soldier and the Army does not benefit either party. For example, if “the Army did not meet the recruit’s expectations,” it may be to everyone’s advantage for the Soldier to leave. Even with the best of intentions, the fit between the new young recruit and Army organizational requirements and demands may not be optimal or beneficial to one, the other, or either. It may be best for the parties to part ways. Attrition may also occurs when a Soldier does not meet Army standards or behaves in an unethical or deviant manner or leaves due to some type of hardship (e.g. in a Family) or an injury.

Attrition may not occur for the same reasons at all phases of enlistment. Soldiers who leave the Army in the first few months are often leaving for different reasons than those leaving after training, or when actually in a unit. For example, *Project First Term* found that the highest attrition rates for both performance and medical/physical reasons happened in the second month of enlistment. On the other hand, attrition related to moral character problems was greatest between months 17 and 36.⁷

In this bibliography, we have included studies on attrition at all phases of enlistment and for any reason. Our goal was to provide a comprehensive reference for attrition research. We have avoided the inclusion of retention and reenlistment studies, unless these studies allude to attrition in the way that we have defined it.

ORGANIZATION AND CONTENT OF THE BIBLIOGRAPHY

The bibliography is organized along two dimensions: 1) decades of publication and 2) topic areas. To some degree the trends in attrition research reflect the critical issues emerging at the time. For example, the role of the Family in Army life was a major topic of study in the 1980s when a growing proportion of Soldiers were married and had Families. The AVF was in a situation where the Soldier Family and Family services were an integral part of the Force and, in order to retain Soldiers, or to keep them from leaving the Army, the Family had to be taken into consideration.⁸ In fact, the role of the Family in a Soldier’s life continues to be an important factor in understanding and studying attrition.

The research usually took one of two directions, studying attrition at either the organizational (Army as a whole) or unit (e.g., training units, platoons, companies, etc.) level. At the organizational level, the research explored attrition in relation to variables that characterize the organization and the relationship between the Soldier and the organization. This research examined attrition in terms of rates. At the unit level, the attrition research explored attrition at a more “micro” level, examining characteristics of Soldiers such as demographics, aptitudes, abilities, disciplinary problems. Additionally, the research explored attrition within special courses, certain types of attrition (e.g.

⁷ Strickland, William J. Ed., (2005). A longitudinal examination of First-Term Attrition and Reenlistment among FY1999 Enlisted Accessions (ARI Technical Report 1172). Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences (AD A448 564).

⁸ Segal, M.W. (1986). The Military and Families as Greedy Institutions. *Armed Forces and Society*, 13 (1), 9-38.

medical attrition), and attrition within job types or Military Occupational Specialties (MOS).

Generally, the majority of the work focused on models that used variables such as Soldier demographics, MOS, Family support, organizational commitment, willingness to serve, unit climate, and leadership quality in an attempt to predict Soldier attrition. In this type of research, factors such as the Family, characteristics of Delayed Entry Program (DEP), job-Soldier match, MOS training, and health were among the many explanatory variables used to conceptualize and build statistical models.

Some research, and at this point a small minority, utilized longitudinal or cohort analyses of attrition (e.g., following a cohort of Soldiers through their terms of enlistment) to determine if there are phenomena in one time period during the duration of the enlistment term which were creating the greatest stress and increasing the rate of attrition. Trend analyses were also used to examine samples of Soldiers at different points in time, but measuring the same variables.

In other attrition research, the focus was on the MOS, a medical characteristic or condition, or the DEP. This research examined how characteristics of these conditions or programs interacted with a Soldier's willingness to remain in the Army and how attrition rates from these impact overall Army attrition.

Finally, Soldier attrition research also addressed interventions, screening and selection methods and criteria that might also reduce attrition.

EARLY ATTRITION RESEARCH IN THE AVF: THE 1980's

With the start of the AVF in 1974, the issue of Soldier attrition quickly became a significant concern for the Army. The AVF brought with it a great need to pay attention to filling the ranks and maintaining an appropriate number of quality Soldiers for force readiness. In response, research in the 1980s began to investigate issues related to Soldier attrition. Several of the studies below reviewed approaches and methods that had been used previously to assess attrition, and the authors recommended approaches to stem attrition that should be attempted in the future. Other research in this section used original approaches and constituted some of the first studies that attempted to understand and predict Soldier attrition.

Early in the study of attrition, the major focus was on variables that described the characteristics of Soldiers such as their race, gender, educational and cognitive aptitude, and Armed Forces Qualification Test (AFQT) scores (Doering & Grissmer, 1985; Goodstadt & Yedlin, 1980). Faris (1984) took a different approach by dividing the first term of attrition into the "early" phase and the "late" phase and examining the impact of Family tradition, expectations, and the ability to deal with military life. He offered suggestions, based on his review of the literature, to appeal to the non-economic motivation of Soldiers to enhance their probability of remaining in service. Alternatively, Stolzenberg and Winkler (1983) studied economic factors. A unique research effort explored the other end of the attrition process – the influence of military termination on economic compensation (Kim, 1982).

A few of the authors were concerned with the effect that interventions may have on stemming attrition. Hicks and Nogami (1984) examined the success of interventions that have been attempted in the past. They found that interventions focused on education, training, and screening tended to achieve the best results. However, the authors warned of the adverse consequences of using screening, as potentially-successful recruits may be screened out along with those that would not succeed. Additionally, Hicks and Nogami (1984) suggested that an improvement in the ability of military leaders to motivate Soldiers may reduce attrition.

In all cases these articles offered recommendations for reducing attrition. They discussed the high cost of Soldier attrition and called for better data to track attrition and identify problems leading to attrition.

Allen, J.P., & Bell, D.B. (1980). *Correlates of military satisfaction and attrition among Army personnel* (ARI Technical Report 478). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A109 456)

This research focused on hypotheses set forth by Goodstadt (1978), which were concerned with Army organizational climate and its impact on Soldier satisfaction, unit effectiveness, and attrition. Data were obtained from the Army Life-78 Study, involving a sample of 8,140 enlisted Soldiers, non-commissioned officers, and commissioned officers (the latter constituting a small minority of the sample).

No single factor stood out as having a large impact on Soldier satisfaction. However, the work climate and characteristics of the job were found to have a greater impact on satisfaction than the impact of problems with or expectations for Army life. Marital status was weakly correlated with satisfaction, and access to resources that assist in Soldiers' ability to cope were found, surprisingly, to decrease satisfaction, refuting the hypothesis posed by Goodstadt. The authors recommended that questionnaires be given early in the tour so that specific attrition cases can later be matched to those questionnaires. This would facilitate a more individual analysis of attrition. Army Leaders who participated in the decision-making process leading to attrition should also evaluate the troops and their perception of the attrition problem. Also, future research should concentrate on how organizational factors affect attrition, rather than individual characteristics.

Antel, J., Hosek, J.R., & Peterson, C.E. (1987). *Military enlistment and attrition: An analysis of decision reversal*. Santa Monica, CA: The RAND Corporation.

This research was done to discover individual recruit characteristics that predicted enlistment and attrition of high school seniors and non-student high school graduates in the United States military. The authors expected that unobservable variables may link enlistment and attrition decisions such as individual preferences that cause one individual to be more likely to enlist and less likely to leave. To test this hypothesis and develop an enlistment/attrition model, data on enlistees were obtained from the Department of Defense (DoD) Survey of Personnel Entering the Military Service and data on non-enlistees were obtained from the National Longitudinal Study of Labor Market Behavior Youth Survey, both from the spring of 1979. The data were analyzed for the first 36 months of service, focusing on six- and 35-month attrition.

The results revealed that the expectation of furthering one's education decreases attrition by one-half to one-third. DEP participation was found to reduce attrition and those with previously unstable employment were found to attrite more often. AFQT scores and labor force participation after completing school were correlated with attrition of high school graduates. No statistical evidence was found to link enlistment to attrition through unobservable variables of individual tastes, as tastes often change during the term. The enlistment/attrition model developed by these authors can be used to predict the enlistment potential of a population and to identify potential attrition of enlistees, allowing for policies to be developed to reduce or maintain attrition. Individuals expecting more education, having a stable employment history, and who were willing to wait for a good job match within the military were three times less likely to leave than other recruits.

Black, M., & Fraker, T. (1986). First-term attrition of high school graduates in the military. In C.L. Gilroy (Ed.), *Army manpower economics* (pp. 261-291). Boulder, CO: Westview Press.

These authors studied the attrition of male high school graduates during the first term of military service. Data on over 11,000 males, surveyed from their 1972 high school

graduation until 1979, were taken from the National Longitudinal Study. These data were combined with information on military performance (e.g., entries, exits, and promotions) from 1972 to 1979, provided by the Defense Manpower Data Center (DMDC). The analysis was unique, as it focused on the period of transition from the draft to the AVF.

Results indicated that mental ability was strongly related to the standards of the military, implying that the AFQT scores used in screening were appropriate. Additionally, high school grade point average was a good predictor of attrition among non-Black students. Furthermore, the consideration of individuals' skills, interests, and aptitude were found to be useful for screening. Goals for post-secondary education, plans to use the GI Bill, and work experience during high school were associated with low attrition. These findings have implications for the development of new policies for screening.

Blandin, J.S. (1980). *Attrition in the All Volunteer Force: A prediction model for non high school graduates*. Monterey, CA: Naval Postgraduate School. (AD A084 908)

This author was interested in creating a model to assist in the prediction of attrition, which may also be useful in the screening of recruits. Data were retrieved from the DMDC on non-prior service and non-high school graduate Army enlistees from FY 1974 and FY 1975. Group linear and group logistic regression models were developed based on recruits' demographic characteristics. These models demonstrated that the variables of years of education, age, and AFQT score had an inverse relationship with the probability of attrition. Based on these findings, the author recommended three possible actions that may reduce the costs of attrition. The first is a recruit screening process that would focus on recruiting individuals of high quality. The second suggestion involves the identification of recruits with a high risk of attrition, and directing counseling efforts at these individuals. A third possibility is to expand the applicant pool by lowering standards for recruits. Further research was recommended in order to be better able to estimate the costs of recruiting in different market segments, as higher quality individuals are more costly to recruit.

Blandin, J.S., & Morris, J.H. (1982). *Predicting attrition among non-high school graduate Army enlistees*. *Armed Forces and Society*, 8(4), 643-655.

This article presented the results of an analysis of involuntary attrition among non-high school graduate Army enlistees. The sample of 178,380 included male, non-high school graduates, who enlisted between 1974 and 1976. The authors developed a model to predict attrition based on recruits' census region, age, level of education, sex, race, AFQT score, month of enlistment, and marital status. The use of the variables included in this model, as opposed to the sole use of AFQT scores, was found to be most effective in identifying low risk recruits and those in need of remedial programs.

Further research is needed to identify the specific cost of attrition, as the cost varies depending on the timing of attrition. However, the authors concluded that, typically, a

non-high school graduate Army recruit costs \$6,943 for one complete term. The authors suggested that offering job previews may allow recruits to have realistic expectations of enlistment and this may help to reduce attrition. Also, training prior to Basic Military Training (BMT) may be appropriate for allowing high risk recruits to adapt to Army life. Finally, the model may prove useful in filling recruitment quotas, so that the lowest risk individuals are the first to be recruited.

Buddin, R. (1984). *Analysis of early military attrition behavior*. Santa Monica, CA: The RAND Corporation.

This research examined the variables impacting attrition during the first six months of the first term of military enlistment, as well as separation from civilian jobs, as compared to early military attrition. Data were acquired from the 1979 Survey of Personnel Entering Active Duty, the Services' enlisted Master and Loss Files, and the DMDC. Using a multivariate model, the author found that, especially in the Navy and Air Force, being unemployed in the year prior to enlistment increased the chance of a recruit leaving in the first six months. Unstable employment also increased the risk of a recruit leaving, especially in the Army and Air Force. Job match variables, such as having previous experience in the military job or being assigned to a desired job, had no effect on attrition in any service. An 8% increase in risk of attrition was found for recruits without a high school diploma or with a Graduate Equivalence Diploma (GED). A recruit's AFQT score was negatively correlated with attrition in all services, though the effect was small. As a recruit's age increased each year after age 17, the risk of attrition increased by 1%, although this effect was not present in the Air Force. Of all the services, race had a significant effect only in the Army. Work history, race, and aptitude were found to have similar effects on civilian jobs as on military jobs. Age had the opposite effect in the civilian labor market, as older workers were less likely to separate. The effect of education was stronger in the military. Job dissatisfaction on the first day had an effect on attrition from civilian jobs, but was found to have no effect in the military.

Buddin, R. (1988). *Trends in attrition of high-quality military recruits*. Santa Monica, CA: The RAND Corporation.

This research was done to assess the reasons for an increase in attrition that occurred after military improvements were made in the early 1980s to recruit higher quality individuals (i.e., high school graduates scoring in the top half of the AFQT). Past findings indicated that high quality recruits suffered half the amount of attrition of low quality recruits. Institutional factors, such as the size of the installation, enforcement of service attrition policies, and management of those policies may affect attrition beyond the quality of recruits.

Nonprior-service recruits were analyzed between FY 1982 and FY 1985 to compare attrition across cohorts, training bases, services, and phases of enlistment. Data were retrieved from the DoD personnel files, which provides detail on Soldier characteristics. In the Army, after new policies were instituted in FY 1985, six month attrition rates were

reduced from 10.9% in 1983 to 7.2%. Army basic training attrition was as much as 9% higher for men and 16% higher for women at some bases than at others. It was concluded that further research needed to be done to determine if varying policies and practices on the different bases and for different cohorts caused the variation in attrition rates, since attrition varied by base in all services but the Air Force.

Doering, Z.D., & Grissmer, D.W. (1985). *Active and reserve force attrition and retention: A selected review of research and methods*. Santa Monica, CA: The RAND Corporation.

This document focused on a review of the approaches that have been taken to study attrition and retention in the military, and also offered insight into approaches that should be taken in future studies. In their very brief review of attrition literature, the authors revealed that studies have shown attrition among those in Active duty to be higher among the less educated and those scoring lower on aptitude tests. Also, men, non-Whites, recruits of age 18 or 19, and recruits with shorter terms had lower attrition rates. Recruits who were unemployed or who had unstable employment prior to enlistment had comparatively high attrition. Indicators of satisfaction with military jobs did not appear, in the research, to have much effect on attrition. The research implies that attrition is strongly affected by institutional policies and it was suggested that policies be stricter in the screening of recruits. The authors recommended that future research on attrition should include more variables than have past studies.

Eaton, N.K., Weltin, M., & Wing, H. (1982). *Validity of the Military Applicant Profile (MAP) for predicting early attrition in different educational, age and racial groups* (ARI Technical Report 567). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A130 939)

This research was designed to assess the utilization of the Military Applicant Profile (MAP) a questionnaire based on recruits' biographical information- to screen older male non-high school graduates. The MAP had been used since 1979 for the screening of younger (17-year-old) male non-high school graduate recruits. MAP data on 4,282 male Army enlistees from November 1976 through February 1977 were collected from Reception Stations, and were evaluated. MAP was assessed as a predictor of attrition by race and educational level, in addition to age.

MAP was found to be an accurate predictor for all races and ages, and thus the authors concluded that the use of MAP as a screening device might be extended to older enlistees. MAP was also found to predict attrition accurately for both high school graduates and non-graduates, but was found by the authors to be most reasonably used for non-graduates, as they have the higher rate of attrition.

Faris, J. (1984). *Economic and non-economic factors of personnel recruitment and retention in the AVF*. *Armed Forces and Society*, 10, 251-275.

This author was concerned with the high rate of first term attrition resulting from the shift from conscription to the AVF. An analysis of studies performed in the past on the AVF was conducted in order to explore the pattern of recruitment and retention among enlisted Soldiers and officers in the force. More educated individuals were most likely to attrite, as they had desirable alternatives to the military and were, thus, less willing to serve than those with less education. Very early attrition in the first term, where motivation to enlist had been mostly economic, suggested that enlistees did not expect and were unable to deal with the high demands of military life. On the other hand, later attrition suggested that Soldiers had non-economic motivations to enlist (e.g., Family tradition), but these motivations could not be sustained in the Army environment. Furthermore, findings demonstrated that non-economic motivations were important both for officer and enlisted Soldier retention. Therefore, the author suggested that a large amount of emphasis on economic incentives is not necessary for recruitment and retention. The authors recommended that efforts be made to improve the representation in recruitment and in units, increase the cohesion and stability in units, and build civic consciousness and self-esteem among members. Finally, the author cited the recommendations for improving Soldier commitment, made by Janowitz (1981)⁹: improvement in the communication of military information, clarification of military regulations, and an increased awareness of the national purpose of the military force.

Goodstadt, B.E., & Yedlin, N.C. (1980). *First-tour attrition: Implications for policy and research*. (ARI Research Report 1246). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A100 957)

These authors presented a review of research on attrition across the military services. Data were also retrieved for review from the DMDC for FY 1972 through FY 1975. A rapid increase in attrition was found between FY 1972 and FY 1974, which was the final year of the draft, and a slower increase in FY 1975. These increases in attrition were attributed to an increase in recruits who were without high school diplomas and to the introduction of marginal performer programs by the four services. Of the four services, the Air Force experienced the least amount of attrition. Research consistently reported a relationship between attrition and the variables of age, test scores, education, and Soldier biography/experience across the services. The reviewed research indicated that an adjustment of entry standards and changes in working conditions, leadership styles, and living conditions may result in an attrition reduction. The following areas were recommended for further research, in order to develop effective management for reducing attrition: the development of tools to predict attrition; the identification of targets for remediation programs; the introduction of programs to develop coping skills among recruits; the development of training policies; the control of discharge authority and/or resources; the more effective use and assignment of personnel; and a closer look at the timing of attrition during the first term of enlistment.

⁹ Janowitz, M. (March 1981). *Civic education and military effectiveness*. Paper presented to the Inter-University Seminar on Armed Forces and Society, Chapel Hill, N.C.

Hicks, J.M., & Nogami, G.Y. (1984). *Counter-attrition programs in the United States Armed Forces* (ARI Research Notes 84-112). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A146 855)

These authors condensed the existing research on counter-attrition programs across the military services, in order to facilitate the continuing research on the topic as well as to help program developers in accessing the research. In their effort, the authors found that the most promising programs were those that focused on pre-enlistment education and training, screening based on predictions of attrition, interventions based on expected outcomes, and correctional retraining. Programs focusing on remedial education and counseling appeared to be useful in incorporating recruits who were unsuccessful and rejected by the civilian society. These authors concluded, from the research, that bio-data (or biographical information) would be useful in screening recruits. Also, correctional retraining programs (or discipline training) were judged to have utility in reducing costs of subsequent attrition, as those not able to withstand the programs would tend to attrite from them. Mixed results were found on the relationship between post-enlistment basic skills education programs and attrition, implying that further research in this area may be of use. The authors also recommended more objectivity in the counter-attrition research, a better attempt to prove causality, and a focus on selection bias, such as a bias that supervisors may have in assigning recruits to programs. Also, field experimentation involving findings from correctional units and those from the active unit environment was suggested to be included in future studies on counter-attrition. Finally, more research on the leadership characteristics that affect attrition was recommended, as well as an historical overview of counter-attrition programs in all institutions.

Kim, C. (1982). *Youth and the military service: 1980 National Longitudinal Survey studies of enlistment, intentions to serve, reenlistment and labor market experience of veterans and attriters*. Alexandria, VA: Center for Human Resource Research, Ohio State University. (AD A185 410)

This report was prepared in order to improve the knowledge that recruiters have of their target population. The report contains analyses on reasons for and characteristics of those who enlist and reenlist. The author also reported on the labor force outcomes of service members that separated prematurely from military service, as compared to civilians who were never enlisted in the military. The analyses were based on the spring 1980 National Longitudinal Surveys of Labor Force Experience, which included 11,147 civilian youths and 984 youths in the Active Forces.

Regarding attrition, females with traditional attitudes were more likely to separate prematurely than those with nontraditional attitudes. Additionally, females who separated early had especially high unemployment rates, though these rates were high among all of the groups studied. Furthermore, the mean AFQT scores of female attritees were higher and the scores of male attritees were lower than their civilian employee counterparts. Male attritees also had lower college enrollment rates than veterans, but not as low as among civilian males, whereas the enrollment of females

was similar across groups. In general, attritees earned significantly less than civilian employees.

Kohen, A. (1984). *Attrition from military and civilian jobs: Insights from the National Longitudinal Surveys* (ARI Technical Report 638). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A168 187)

These authors developed a conceptual model to predict attrition from the military. The conceptual model considers recruits' education, parents' education, job satisfaction, type of MOS, amount of pay, benefits, desire to continue education, availability of employment in the civilian sector, and "perceived locus of self-control". Multiple regression analyses were performed to assess the relationship of these variables to attrition. A decrease in wages and job satisfaction, and an increase in self-control were related to an increase in attrition. Technical and support MOSs were found to have the highest attrition rates. The author concluded that it is not a good investment to recruit individuals who attended but did not complete college, as they are overeducated for many of their tasks and tend to attrite more often than others. Additionally, the author recommended making a better effort to enhance the experiences of recruits by increasing the pay and monitoring the types of MOS to which recruits are assigned. Based on the analysis of the National Longitudinal Survey of Youth, a large similarity did not seem to exist between civilian and military sectors in terms of reasons for quitting, but as data improve there may be more use for research in this area. Only male enlistees were considered in this research, but research on the reasons for women to attrite would also be useful.

Sinaiko, H.W., Chatelier, P.R., Cook, C.A.; Hosek, J.R, & Sicilia, G.T. (Eds.). (1981). *Military personnel attrition and retention research in progress* (Technical Report 10). Smithsonian Institution, Manpower Research and Advisory Services: Washington, DC. (AD A107 892)

This report presented a compilation of research on attrition and retention in the military services, being performed in 1981. It was based on a workshop that was held, where researchers shared their research plans and findings. The editors of this document gave a brief summary of each research effort that was presented.

Researchers tended to focus on individual characteristics as they related to attrition, but organizational factors were increasingly a focus of attrition studies. Also, data were comprehensive enough to perform cross-national comparisons of attrition and the tracking of cohorts allowed for the targeting of specific groups in attrition intervention. An important relationship was found between leadership and attrition. Non-high school graduates had very high attrition when being led by drill instructors with histories of having recruits with high attrition rates, implying that attrition is not solely determined by recruits' individual characteristics. Attrition was found to vary across military occupations, and not all non-high school graduates were found to have high attrition. First term attrition was of primary concern in the research, although factors affecting the retention of military careerists (e.g., quality of life and economic factors) were perceived

by researchers to be important as well. Job attitudes were also found to be predictive of attrition. Researchers suggested the need for further studies on individuals' transition to an organization, the demand side of retention, and the identification and categorizing of retention problems.

Stolzenberg, R.M., & Winkler, J.D. (1983). *Voluntary terminations from military service*. Santa Monica, CA: The RAND Corporation.

These authors performed a review of the research on military terminations, including mid-term termination, non-reenlistment, and officer resignation. The factors that were consistently found to influence military job termination were compensation (although non-pecuniary factors have been found to have more of an influence), job satisfaction and relationship with one's employer, support of the organization, rewards of military life, and biographical information on recruits. Biographical variables that have been found to increase termination are antisocial behavior, delinquency, poor adjustment, lack of high school diploma, presence of a spouse or dependents, and being under age 18 at time of enlistment. Also, the studies suggested that when the reality of a military career is different from the recruit's expectations, the chance of termination is increased. For future research, the authors recommended improvements by using longitudinal data, measurements of satisfaction of military personnel, and attention to causation. Also, analyses should include pecuniary and non-pecuniary variables that may affect military job termination. Finally, civilian job termination should be considered in analyzing military job termination, as the two are comparable with the advent of the AVF, especially during peacetime.

Ward, M.P., & Tan, H.W. (1985). *The retention of high quality personnel in the U.S. Armed Forces*. Santa Monica, CA: The RAND Corporation.

This research focused primarily on the relationship between recruit quality and reenlistment, but also briefly discussed its relationship to attrition in the military services. The authors defined quality as a combination of performance measures (e.g., promotion during the first term), entry-level characteristics (e.g., AFQT scores), and background characteristics (e.g., education). The research sample included all male, non-prior service recruits entering active duty in 1974. Regarding attrition, the authors found that recruits that prematurely leave the services are generally of the lowest quality in terms of performance. However, neither AFQT scores nor education were found to have a relationship with attrition.

Wharton Applied Research Center. (1980). *Enlisted Soldier recruitment and retention*. Washington, DC: WESTAT.

This report presented research plans regarding improvements in recruitment, attrition, and reenlistment in the AVF. Specifically, attrition had been a concern since the AVF was instituted, and was especially high in its first years. A disproportionate amount of attrition occurs in the combat arms. The high rate of discharge in the Army, prior to the completion of Soldiers' first terms, is a significant and costly problem in the AVF. The

author proposed the recruitment of high quality personnel, as they will be less likely to leave prematurely. The publisher's main interest was in analyzing the impact of unit management on attrition, assessing the use of post facilities to counter attrition, validating counter-attrition programs that have been instituted in the past, and developing a handbook for commanders on how to manage attrition. The ultimate goal of this research was to develop an intervention plan that would be more successful than interventions had been previously.

BUILDING MODELS TO PREDICT ATTRITION: THE 1990's AND THE EARLY 2000's

The research described in this section was conducted throughout the 1990's and into the early 21st century. Although some studies in this section examined attrition at the beginning of the AVF, the majority of studies progressed beyond this initial research with goals of building models to predict Soldier attrition, validating screening levels for recruit quality, and making recommendations regarding instruments that could be used in the recruitment of Soldiers. With advancements in statistical techniques, the analyses tended to be multivariate and more complex than those conducted in the 1980s.

The authors of this period were interested in a range of variables to predict attrition. Many of these investigations used measures of education as predictors, concentrating on the difference between recruits with less than a high school education, those with high school diplomas, and those that did not graduate from high school. The authors were most interested in the attrition of male recruits, rather than female recruits. Consistent findings supported conclusions that education, job satisfaction, MOS assignment, and AFQT scores were the best predictors of attrition (Laurence, Ramsberger, & Arabian, 1997; Kohen, 1984; Dempsey, Laurence, & McBride, 1991; Antel, Hosek, & Peterson, 1987; Manganaris & Schmitz, 1984). The range of attrition rates was wide across MOS (Manganaris & Schmitz, 1984), with combat MOS displaying the highest rates (Ramsberger, 1999). Marital status, civilian employment opportunities, and deployment experience were also found to be related to attrition (Castro & Huffman, 2002; Dempsey, et al., 1991; Kohen, 1984).

Another method of approaching Soldier attrition issues was to develop new screening processes that would work towards an increase of recruits, but only for those who would be most likely to be successful in the Army. The Assessment of Individual Motivation (AIM) was assessed to determine if non-high school graduates who would be otherwise ineligible for military service could enlist if they scored sufficiently high on the AIM and met other program requirements. In this context the AIM was examined as an attrition predictor using operational data (Knapp, D. J., et. al., 2004).

Allison, R.E. (1999). *Analysis of first-term Army attrition- Strategy Research Project*. Carlisle Barracks, PA: U.S. Army War College. (AD A362 968)

This research presented an assessment of some of the causes, trends, and costs of enlisted attrition in the Army, and also compared attrition in the Army to attrition in other services. The author noted that Army attrition is more severe than that of the other services and is a major concern as investments in individual Soldier readiness are lost when a Soldier leaves. In order to determine the impact of attrition on readiness, the research focused on attrition rates, recruitment and training, causes of attrition after completion of training, Soldiers' expectations and things that the Army can do to reduce first-term attrition. The author suggested that the way to initiate an improvement in retention is to establish a database which reflects more accurately the diverse reasons

that Soldiers leave the Army. In turn, such data can aid in screening and counseling individuals that are being recruited, provide information to improve counseling and leadership for new recruits and trainees, improve control over medical discharges, as well as attempt to reduce homesickness and improve privacy.

Buttrey, S. (1999). *Determining characteristic groups to predict Army attrition*. Monterey, CA: Naval Postgraduate School, Department of Operations Research. (AD A362 511)

This author was particularly concerned with developing new variables of Soldier characteristics to update computer programs used by the Office of the Deputy Chief of Staff for Personnel (ODCSPER) that would facilitate the prediction of attrition and reenlistment, with special emphasis on first-term attrition. Data was taken from a database maintained by an ODCSPER contractor, which included all first term enlistees from January 1987 through June 1989. Using the new variables (gender, race, age at beginning of term, length of term, AFQT scores, and level of education), the most significant difference in attrition was based on gender, with women completing their term at a rate of 45% and men completing at a rate of 60%. White women had higher attrition rates than nonwhite women, whereas this racial difference was less significant for men. Smaller differences between the demographic groups were found when looking at the term of enlistment, level of education, AFQT scores, rates of reenlistment, and early first-term attrition.

Campbell, J.P.; Zook, L.M. (Eds.). (1996). *Building and retaining the career force: New procedures for accessing and assigning Army enlisted personnel- Final Report* (ARI Research Note 96-73). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A320 954)

This paper was the final report of an extensive research project, which focused on the development of selection criteria for Army recruits in order to improve performance and avoid attrition. Researchers were interested in validating the Armed Services Vocational Aptitude Battery (ASVAB) and coming up with new ways to predict performance in the Army. Performance is partly measured by attrition, with low attrition being a factor in high performance. Data from the Longitudinal Validation sample, consisting of 10,000 first tour and 1,500 second tour individuals entering the service in 1986 and 1987 were analyzed across MOS.

The ASVAB was found to be an excellent predictor of performance, especially technical task and leadership performance. However, different variables predicted those who *can* versus those who *will* perform well. The best predictor of technical task performance was cognitive abilities, followed by aspects of personality and interests. Further research was recommended to differentiate between the performance components for different MOS, to be used in job assignments.

Castro, C. A., & Huffman, A. H. (2002). *Predicting retention rates of U.S. Soldiers stationed in Europe*. Heidelberg, Germany: U.S. Army Medical Research Unit-Europe.

The main goal of this research effort was to determine the ability of two different models (a chi-square automatic interaction detection model and a multinomial logistic regression model) to predict the retention of U.S. Army officers and Soldiers deployed in Germany or Italy. A sample of 289 Soldiers and junior officers who were soon going to make or had recently made a career decision regarding reenlistment, were surveyed between June 1999 and December 2000. Results indicated that Noncommissioned Officers (NCOs) and officers were more likely to stay in the military than junior enlisted Soldiers, and that the older Soldiers and officers were more likely to report having plans to remain in the military. Personnel with deployment experience were more likely to stay in the military, and those spending more time on temporary duty and having deployed more often reported indecision about their career, rather than a decision to leave. Soldiers with more years in the military were more likely to report having the intention to stay. Those with more Soldier pride were found to be more likely to report that they were staying in the military than those with low pride, and this intention was enhanced by high job satisfaction. Also, Soldiers perceiving better NCO leadership were more likely to report their intention to stay in the military, with perceptions of other forms of leadership (e.g. officer leadership, general leadership, horizontal cohesion, and morale) increasing this intention.

When looking at Family variables, it was found that married personnel were more likely to have the intention to stay in the military than single personnel. For the chi-square automatic interaction detection model, the most accurate predictors of retention were concluded to be years in the military, deployment experience, and job satisfaction. The predictions were most accurate for those intending to leave than those intending to stay, and were not at all accurate for undecided personnel. The OPTEMPO work climate model, including variables measuring the high pace of military operations, was the best predictor in the multinomial logistic regression model. The authors suggested that future research include variables that were omitted from these analyses. They suggested that variables such as the civilian economy, adverse reasons for military separation, and inevitable variables affecting attrition (such as health conditions or misconduct) be measured before the actual career decision is made. In this sample, some individuals had already made their decision at the time of the survey. Also, future research should connect the self-reported intentions, included here, to actions taken.

Dempsey, J.R., Laurence, J.H., Waters, B.K., & McBride, J.R. (1991). *Proposed methodology for the development of a compensatory screening model for attrition* (FR-PRD-91-17). Alexandria, VA: Human Resources Research Organization.

These authors developed compensatory screening models to predict first-term attrition from the military. The screening implemented previous to this research effort only used aptitude and education credentials. In this research, the authors included additional

variables. Logistic regression models revealed that age, Mathematics Knowledge (MK) score, marital status, having dependents, as well as education and Armed Services Applicant Profile (ASAP) scores were most predictive of attrition. This model predicted up to nine percent of the variance in attrition, whereas the previous model only accounted for two percent.

Greenston, P.M., Nelson, A., & Gee, D. (1997). *The optimal job-person match case for attrition reduction* (ARI Study Report 97-06). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A338 823)

In this research, the authors determined whether the use of the Enlisted Personnel Allocation System (EPAS) would improve job assignment of Army recruits and reduce attrition. The authors stated that a shortcoming of the existing assignment system is its reliance on minimum qualifying scores to determine eligibility for training and job assignment. Therefore, recruits are not necessarily assigned to jobs for which they have the best qualifications. EPAS is a model to introduce optimization into the job-person-match process with the objective of the programming being to maximize Soldier performance.

Data from the 1991 accession cohort was tested using the Enlisted Panel Research Data Base, obtained from the U.S. Army Research Institute. Using a proportional hazards model, a relationship was estimated between attrition behavior and predicted performance. For the 1991 cohort it was estimated that during the first 36 months there were 368 fewer attritees. Generally it was found that the hypothesis was supported: an increase in predicted performance is associated with reduced attrition rates. This was a consequent of optimizing the job-person match. For the 1991 cohort over the first 36 months there was an estimated 368 fewer attritees, with a corresponding recruiting and training cost savings of \$8.5M per year. Therefore, the use of EPAS to increase Soldier performance would have an impact on lowering attrition and saving money.

Hickman, S.B. Colonel. (2003). *Army enlisted attrition: Where are we and where do we go from here?*- Strategy Research Project. Carlisle Barracks, PA: U.S. Army War College. (AD A414 081)

This article addressed the trend, in recent decades, of increased Army enlisted attrition by reviewing the existing facts regarding attrition. Of greatest concern was attrition from Initial Entry Training (IET) as well as first-term attrition. Although the overall attrition rate came down to 30% in 2003 from its peak of 37%, for enlistees entering service in the Fiscal Years 1994 and 1995, the rate remained very high. The author suggested that attrition be looked at more closely in order to determine the causes and to restructure policies.

The author pointed out that the Army has taken actions to reduce attrition, but more needed to be done to reach the goal set by the Department of the Army. Because recruitment had become more of a concern for the Army in recent years, focus had been taken from efforts to retain Soldiers. Also, the action taken by the Army thus far

had been more effective in delaying attrition, rather than in preventing it. Therefore, the author suggested the Army do more to decrease attrition in the long-term by addressing recruitment, accession, training, and leadership as a complete cycle.

Klein, S., Hawes-Dawson, J., & Martin, T. (1992). *Why recruits separate early*. Santa Monica, CA: The RAND Corporation.

These authors were interested in uncovering real reasons behind attrition in the first 35 months of service, beyond those reasons coded using the Interservice Separation Codes (ISCs). Data for a random sample of 1,134 personnel entering military service in FY 1979 or FY 1985 were retrieved from the National Personnel Records Center in St. Louis, Missouri, based on data at the DMDC.

The authors found that having a work/duty problem was often cited as a reason for separation, and this usually accompanied another reason, such as alcohol abuse or having a negative attitude. The other top reasons for attrition that were cited include training problems, minor offenses, and mental health problems. Drug and/or alcohol problems were common, and recruits that were serious criminal offenders were more likely to have these problems and less likely than others to have mental health problems. There was little difference in reasons for separation based on recruits' branch of service, gender, race, fiscal year of enlistment, entry into a MOS with a high rate of attrition, and the point in recruits' term that the separation occurred. Women were more likely than men to have mental health problems, and men were more likely to separate due to alcohol/drug problems and criminal offenses. As the amount of time a recruit spent in service increased, the likelihood of attrition for more than one reason increased. Based on these findings, the authors concluded that ISCs were too simplistic in measuring the reasons for attrition and are not valid or reliable. Most recruits had more than one reason for separation and these reasons were not predictable based on background information. The authors noted that an inability to adjust to military life was a significant reason for attrition, and further research on this may reveal possible attrition intervention policies, such as screening or counseling.

Knapik, J.J., Jones, B.H., Hauret, K, Darakjy, S., & Piskator, E. (2004). *A review of the literature on attrition from the military services: Risk factors for attrition and strategies to reduce attrition*. Aberdeen Proving Ground, MD: Army Center for Health Promotion and Preventive Medicine.

These authors performed a literature review on attrition, across military services. They found that an abundance of research has focused on demographic and psychosocial factors impacting attrition. These studies have reported that risk factors for attrition include having lower education, being female, being White, having low AFQT scores, having less of a history of conforming to laws/rules/regulations, receiving moral waivers, spending less time in DEP, and factors that measure job history. Though less researched, health and fitness related factors seemed to have an even greater influence on attrition. These risk factors included the receipt of medical waivers, pre-enlistment alcohol use, pre-enlistment physical activity, greater body weight upon enlistment,

mental health history, being subjected to sexual and physical abuse, history of heavy smoking, referral to mental health facility during basic training, hospitalization for mental health early in enlistment, and low physical fitness at entry. Screening efforts that have been developed may erroneously screen out recruits that would have been successful. Counseling and programs directed at retaining recruits had been successful. Senior leadership appeared to have the most influence in reducing attrition in basic and advanced training. The authors suggested that the next step in attrition research should be to combine the risk factors into one research effort, in order to compare their relative significance.

Knapp, D.J., Heggestad, E. D., Young, M. C. (2004) *Understanding and Improving the Assessment of Individual Motivation (AIM) in the Army's GED Plus Program* (ARI Study Note 2004-03). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

In 1996, ARI developed the AIM in an effort to build an assessment tool that would provide scores that measured personality constructs (Dependability, Adjustment, Work Orientation, Agreeableness, Leadership, and Physical Conditioning), and was also resistant to the effects of faking and coaching. AIM was built on the foundation of the Assessment of Background and Life Experiences (ABLE), which was never operationally implemented in the Army due to the fact that its predictive validity was near zero for job-related criteria when test-takers were coached or instructed to fake their scores. Preliminary research indicated that AIM did predict first-term attrition and was less susceptible to effects of faking and coaching than had been the case with ABLE. AIM scores were similar across gender and racial groups and were also positively correlated with self-report measures of Soldier adjustment to the military, confidence in their ability to complete Basic Training, and commitment to complete their term of enlistment.

Laurence, J.H., Naughton, J., & Harris, D.A. (1996). *Attrition revisited: Identifying the problem and its solutions* (ARI Research Note 96-20). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A309 172)

These authors compiled a non-exhaustive review of the literature on first-term enlisted attrition in the military services. They found that there is a need for more comprehensive codes to document the reasons for attrition, so that these reasons may be better understood. It was also suggested that an effort be made to discover behaviors leading to attrition, in order to give attention to the individuals displaying these behaviors. In addition, most studies focused on a single variable to predict attrition, and it was recommended that more variables be combined in future studies. Moreover, unrealistic recruit expectations of concern and should be addressed by providing recruits with more preparation for military life. Recruiter goals should be adjusted so that recruiters are rewarded only when recruits complete training. Finally, individual and organizational factors that affect attrition should be taken into account in efforts to address attrition.

Laurence, J. H., Ramsberger, P. F., & Arabian, J. (1997). *Education credential tier evaluation* (ARI Research Note 97-07). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A335 804)

This research assessed the accuracy of the three-tiered credential system used by the military services, developed based on the results of a 1980 research effort. This credential system is used in selection in order to enlist individuals that are least likely to attrite (e.g., individuals that possess at least a high school diploma). The authors looked at the coding systems used for credentials in the different services and also looked at different cohorts over time. A multivariate analysis was used to examine other variables beyond the use of education credentials in selection.

While education was the most influential variable affecting attrition, educational credentials did not vary with attrition over the years. Other variables affecting attrition were age, gender, AFQT score, race, marital status, and receipt of a moral waiver for attrition. Educational credentials were inconsistently coded across the services, which is problematic when trying to link attrition to such credentials. The authors recommended that the coding of these credentials be continually monitored to keep pace with the increasing variety of credentials that recruits possess (e.g., home schooling) and to be certain that the use of credentials in screening helps to reduce attrition. Also, the same codes should be used across services, and these codes should be verified to ensure that they are exhaustive, mutually exclusive, and that the codes resemble the credential title that they represent. Finally, the authors suggested the use of exit surveys for personnel that attrite, in order to improve the understanding of the attritees' point of view.

Ramsberger, P. Laurence, J. H., McCloy R. A., DiFazio A.S. (1999). *Augmented selection criteria for enlisted personnel* (ARI Research Note 99-23). Alexandria, VA: Human Resources Research Organization. (AD A363 068)

The goal of this research was to identify characteristics of individuals who scored below average on the AFQT. The AFQT is used to differentiate between those who can or cannot perform successfully in various Army jobs. The AFQT is part of a battery of tests known as the ASVAB. When the ASVAB was initiated in 1976 there turned out to be flaws that went undetected and impacted the method used to determine appropriate percentiles scores in the normative population. The misnorming resulted in the accession of recruits who would have been in below average AFQT categories.

Data were drawn from 150,000 Soldiers who enlisted during the misnorming period, before the correction in 1980 in order to generalize to present day findings. The best predictor of attrition was found to be high school diploma status, which was also the best predictor of promotion. Age at entry predicted attrition, as well, but was a better predictor of promotion. The highest attrition was found in combat MOS assignments, jobs with low complexity and for Soldiers with relatively difficult work conditions. ASVAB scores, however, were not found to be significantly related to attrition. The authors

concluded that the existing screen to predict attrition and promotion by high school diploma status was effective.

Strickland, W.J. Ed., (2005) *A longitudinal examination of first-term attrition and reenlistment among FY1999 enlisted accessions* (ARI Technical Report 1172). Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Project First Term was developed as a multi-year, investigation of Soldier attrition and reenlistment among the cohort of recruits who joined the Army in FY 1999. The research evaluated models of attrition and reenlistment intentions based on information drawn from personnel records and surveys as Soldiers entered the service, completed training segments, conducted duty assignments, and left the service. Statistical models were built to explore the reasons for attrition and reenlistment intentions, and offered suggestions for management strategies that might be employed to reduce attrition.

The author found that early attrition was due, chiefly, to performance and medical factors which accounted for 80% of the attrition in the first 6 months of service. Half of the attrition between years 2 and 3 was primarily due to pregnancy and parenthood. After Soldiers went to their units, deviance problems played a large role in attrition. This research makes clear the complexity of Soldier attrition.

Taylor, T.Z. (2005). *Strength maintenance: A risk management approach. Military Review, 85(1), 63-68.*

This article reviewed recent attrition and retention research to develop suggestions to reduce attrition and improve retention. The author suggested that risk management be applied in programs aimed at increasing retention and reducing attrition. This would entail the identification of hazards, an assessment of these hazards, the development and execution of hazard controls, and the evaluation of the use of these controls. The author also emphasized the importance of Army leaders in promoting retention of Soldiers. Based on retention research that had been done, the author reported that the decision of a Soldier to stay in or leave the Army was based on the cohesion and pride within groups and teams, the satisfaction with and preparedness for job assignments, and the quality of unit management.

Young, W.Y. (1998). *Development and assessment of a prototype database for tracking first tour non-prior service regular Army attrition* (FR-EADD-98-04). Alexandria, VA: Human Resources Research Organization.

This research was performed in order to develop a database for tracking first tour attrition. The First Tour Attrition (FTA) database was drawn from the FY 1992 non-prior service accessions and a compilation of five existing military databases: DMDC Cohort Files, Operational Recruiter Master File (ORMF), Active Army Recruit Database (AARCRT), Army Training Reporting Record System (ATRRS), and the Enlisted Master File (EMF). The total population of the database was 83,419. The author of this project

redefined DEP loss to exclude those individuals that renegotiated their contracts, were expected to reappear as recruits, and did not have a discharge date or code. This reduced the original finding of 34% DEP loss to 14.4%. The database is available for testing accuracy and conducting research on attrition.

ATTRITION IN EARLY PHASES OF ENLISTMENT AND THE DELAYED ENTRY PROGRAM

Another way to review attrition studies is to arrange them by topic rather than by the time or decade in which the research took place. We did not organize the following research by decade or time because it was thought that the user of this bibliography might benefit by a broader approach in which Soldier attrition is studied by the timing of attrition. The following sections are samples of such research.

The studies in this section focused on attrition that occurs early in recruits' duty, many focusing specifically on attrition during the period called DEP – the Delayed Entry Program. Recruits enter the DEP just after signing up for service, but before they are actually called for training and Active duty. Similar to the previous sections, these authors were interested in determining which recruit characteristics predict attrition. However, the focus is narrowed to attrition from DEP and initial entry training. Because the highest rate of attrition occurs during this early phase of enlistment, it is an important topic of study.

Individuals going into Active duty begin by enlisting in the DEP. This is an actual enlistment into the inactive reserves, with an agreement to report for active duty at a specific time in the future. Under current regulations, one can remain in the DEP for up to 365 days. Studies of DEP attrition have looked at the impact on future training or in-unit attrition as well as attrition from the DEP itself.

Studies on DEP vary in their conclusions of whether the length of DEP has a positive or negative effect on attrition. Taking into account that models and samples vary, some research found that a greater length of time in DEP is associated with Soldiers leaving the Army prematurely at a lower rate (Warner & Solon, 1991; Nelson & Kearn, 1990; Manganaris & Schmitz, 1985).

These authors found that DEP increased the chance of retention (beyond the first enlistment), and labeled the program as a motivational screening or a socialization mechanism. Still, other authors determined that there was no relationship between DEP length and attrition (Zimmerman, Zimmerman, & Lathrop, 1985). Furthermore, attrition rates in DEP had been shown to be dependent on factors external to the military, especially the health of the civilian job market and economy. While waiting to be called, if the right civilian job was available, recruits were likely to leave for a better civilian economic prospect.

Research on the impact of DEP on Army attrition included models that also took into account Soldier demographic variables such as race, education, AFQT score, and the amount of time spent in DEP (e.g., Manganaris & Schmitz, 1985). Other studies examined factors affecting attrition from the DEP itself, including recruiting policies, personal characteristics, and economic factors (Nelson & Kearn, 1990).

The following studies reveal some possible reasons for attrition early in service and the ways in which participation in the DEP may affect Soldier attrition later on in the service.

Buddin, R. (2005). *Success of first-term Soldiers: The effects of recruiting practices and recruit characteristics*. Santa Monica, CA: The RAND Corporation.

This research effort examined which recruits are at a heightened risk of leaving the Army during their first-term and assessed possible strategies to reduce first-term attrition. The sample included 550,000 Army first-term Soldiers, enlisting between FY 1995 and FY 2001. Factors affecting attrition at different stages of enlistment were reviewed.

Female recruits and recruits with GEDs dropped out at higher rates than did men and recruits with high school diplomas. Recruits entering the Army in poor physical condition were less likely to finish initial training. Recruits in the combat arms MOS attrited at a higher rate and reenlisted at a lower rate than recruits in other MOS. Additionally, an increased length of the DEP was associated with increased attrition. To improve retention, the author suggested that the Army assign recruits with GEDs to jobs with shorter training duration or recruit GED holders with less risk of separation. The Army could also take steps to help high-risk recruits to adjust to Army life. Based on the findings, the author offered the following recommendations: shorten DEP for high school seniors, reconsider fitness training in the context of first-term attrition, monitor the efficiency and execution of training standards and policies, consider implementing policies to help demographically high-risk recruits, monitor promotion and its effects on retention, and improve the quality of data collection.

Burnstein, D., & Hopson, J.A. (1990). *Attrition in Military Intelligence Interrogator Training: Identification of possible causes* (ARI Research Report 1554). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A221 288)

This research focused on the high rate of attrition from the Military Intelligence Interrogator Training, for which the authors attempted to identify the causes and possible solutions. Data on 468 students enrolled in classes during 1987, 1988, and the first quarter of 1989 were obtained from the Exploitation Division of the Department of Human Intelligence. Results indicated that those with English as a second language had significantly higher attrition. This was found to be preventable by increasing the skilled technical (ST) cutoff score by 10 points, to 105. An adjustment in instruction methods, giving these students more attention, was also suggested. Of the 124 failing students, many dropped out by choice or were dropped due to a lack of ability to perform in the course, indicating that screening methods could be used to eliminate these students from the recruiting pool. Another recommendation for addressing the high attrition from this course was to keep track of the errors that student's make and the reasons for these errors so that methods to reduce these errors may be developed in the future.

Celeste, J.F. (1985). *Delayed Entry Program contracting cohort loss analysis: A replication* (ARI Research Report 1402). Rockville, MD: Westat, Inc.

This report presented the results of an investigation, which replicated a prior research effort, focusing on attrition during one year of participation in DEP. Mini-master files were obtained from the Program Analysis and Evaluation Directorate of United States Army Recruiting Command (USAREC) for FY 1981-1983. Active Army enlistment contracts signed between October 1981 and March 1983 were also used.

While the original research effort, performed for a briefing by the DEP Efficiency Task Force, found no relationship between DEP length and DEP loss, this research found a strong positive relationship. Across enlistment times, the AFQT level of recruits had conflicting relationships with DEP loss rate. High school graduates and seniors, in FY 1982 and FY 1983, had significantly lower rates of DEP attrition than non-high school graduates. In these years, as well as in FY 1981, graduate and senior male recruits had significantly lower attrition than non-graduates, while there was no significant difference for females. In comparison to males of the same AFQT and educational level, females experienced over twice as much attrition and had longer DEP lengths (with the exception of recruits enlisting in early FY 1983). The authors recognized that this research was limited and suggest that multivariate analyses be performed.

Dyer, F.N., Burke, W.P., Williams, R.A., & Hilligoss, R.E. (1984). *Relationships among rates of attrition in training and subsequent attrition in line units* (ARI Research Report 1377). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A159 453)

In this report, attrition rates were compared for Soldiers in Basic Combat Training (BCT), Advanced Individual Training (AIT), and the successive line units in order to determine the effects of management and leadership on attrition. Data on Soldiers in infantry training between January 1976 and December 1978 at Fort Benning, Georgia were obtained from files on training and separation. This research was carried out under the "constant attrition hypothesis," which predicts that there would be a negative correlation between attrition in training and attrition in line units. In other words, there will always be a certain amount of attrition, the majority occurring either earlier (in training), or later (in a unit), but not at the same rate in both.

The constant attrition hypothesis was refuted. Attrition in training and in line units were positively correlated. Attrition dropped both during training and later for Soldiers in line units from 1976 to 1978. This provides evidence that there are factors concurrently affecting attrition in training and line units. One major discovery of the report was that changes in Army attrition policies can have great impact on reducing training attrition. The second significant finding was that if attrition is reduced during training, it will not necessarily increase after Soldiers complete training and join a unit. So, an increased leadership effort and a policy to achieve low attrition in training could also help to reduce attrition rates in the long term.

Fischl, M.A., & Blackwell, D.L. (2000). *Attrition in the Army from signing of the enlistment contract through 180 days of service* (ARI Research Report 1750). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A372 717)

This research attempted to develop a profile of Soldiers that leave the Army prematurely. All non-prior Active service members contracted in FY 1992 and FY 1993 were tracked from the DEP through 180 days of training to examine attrition and the feasibility of a pre-enlistment attrition screen. While non-high school graduates were found to have high attrition rates, males in this category that had completed 15 college credit hours and females that had been involved in military youth programs were exceptions. Therefore, this investigation indicated that greater effort to recruit people with these qualifications (e.g., more education) is likely to have positive results. Also, scorers in AFQT Mental Category IIIB had attrition rates equivalent to those scoring in Mental Category IIIA, leading to the conclusion that scorers in the different categories did not need to have different recruitment standards. It was determined that, had a screening process been used in recruitment, DEP and training attrition would have been reduced by less than 1% and 1.5%, respectively and up to 13,000 fewer applicants would have qualified. Therefore, the authors concluded that under these circumstances a screen did not seem advisable for reducing attrition.

Hauret, K.G., Knapik, J.J., Lange, J.L., Heckel, H.A., Coval, D.L., & Duplessis, D.H. (2004). *Outcomes of Fort Jackson's Physical Training and Rehabilitation Program in Army Basic Combat Training: Return to training, graduation, and 2-year retention. Military Medicine, 169(7), 562-567.*

These authors addressed the effects of the Physical Training and Rehabilitation Program (PTRP) on the retention of Soldiers at Fort Jackson. The PTRP was designed to serve as rehabilitation for recruits that were injured in BCT. Data on Soldiers assigned to PTRP between January 3, 1998 and July 24, 2001 were obtained from the Physical Therapy Clinic at the Moncrief Army Community Hospital at Fort Jackson.

The authors found that women were discharged more often than men from PTRP, BCT, and also two years after BCT graduation. Younger recruits were more often discharged from PTRP, while older recruits were at a slightly greater risk of discharge from BCT (than recruits of average age range). Overall, 48% of men and 60% of women who were assigned to the PTRP were discharged from the Army, and the majority of these discharges were due to performance or a lack of motivation. A minority of discharges were due to medical reasons. Graduation rates for males and females assigned to the PTRP were comparable. Also, the rate of two-year retention in the Army, after graduating from BCT, was similar for recruits completing PTRP and those not having been assigned to the PTRP. Additionally, the authors discovered that, when women had a choice in whether or not they were assigned to the PTRP, they were discharged at a lower rate.

In the future, research should be more focused on the high rate of discharge due to motivation and performance problems in order to discover an effective method of intervention. Also, it could be useful to compare the effects of being assigned to the PTRP versus being kept in BCT after an injury. Finally, a cost-benefit analysis of the PTRP would be helpful in further assessing its effectiveness.

Hayden, T.W. (2000). *Initial Entry Training: Reducing first-term attrition through effective organizational socialization- Strategy Research Report*. Carlisle Barracks, PA: U.S. Army War College. (AD A378 198)

This author was interested in examining the socialization process that occurs in IET with the goal of determining a method of reducing first-term attrition in the Army. Behavioral scientists attribute organizational attrition to problems with commitment and motivation, skill development, employee expectations, and a failure to meet performance standards. Successful organizational socialization programs, on the other hand, seem to consider socialization stages and tactics, individual characteristics of Soldiers, and the importance of the trainer or role model. The tactics of socialization (used to introduce new Soldiers to the culture, norms and values of the Army) that were being used in IET at the time of this research effort may appear to be structured well, but elicited some problems that could be preventing the reduction of first-term attrition. In order to correct these problems, the author offered the following recommendations: IET should include all principles of organizational socialization; the Army should try to socialize new recruits before they enter IET; strategies used in socialization should be reviewed occasionally to ensure a focus on individual characteristics; and the drill sergeants should be thoroughly instructed in how to most effectively socialize Soldiers.

Knapik, J.J., Hauret, K.G., Lange, J.L., & Jovay, B. (2003). Retention in service of recruits assigned to the Army Physical Fitness Test Enhancement Program in Basic Combat Training. *Military Medicine*, 168(6), 490-492.

In this article, recruits participating in the Army Physical Fitness Test Enhancement Program (APFTEP) were compared to non-APFTEP recruits (those passing the Army physical fitness test at the end of BCT) to examine the effectiveness of this program in retaining Soldiers. Case subjects were recruits assigned to the APFTEP at Fort Jackson, South Carolina from January 1999 to June 2001 (637 men and 746 women). These case subjects were matched to control subjects from the Army Medical Surveillance Activity on the basis of age, gender, entry date, location of BCT post, and active Army status.

The graduation rate from BCT of APFTEP recruits (85% men and 80% women) was lower than the overall graduation rate of recruits (93% men and 87% women). APFTEP recruits were found to be much less likely than non-recruits to be retained in Active status after one year. Thus, it was concluded that APFTEP had limitations in its ability to retain Soldiers, although it was effective in retaining Army recruits that would otherwise be discharged upon failure to pass the Army physical fitness test at the end of BCT.

Manganaris, A.G., Schmitz, E.J. (1985). *Impact of Delayed Entry Program participation on first term attrition* (ARI Technical Report 665). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A178 669)

These authors primarily studied the effects that participation in the DEP had on first-term attrition from 13 different Army MOSs. The effects of race, gender, amount of time spent in DEP, education, and AFQT score on attrition were also analyzed. A database on recruit characteristics was developed based on a cohort file from the DMDC of FY 1981.

Similar to findings of other studies, high school graduates, males, Blacks and those with high AFQT scores were found to have the lowest attrition. The analysis revealed that most (nine out of 13) of the MOS assignments were significantly impacted by time spent in DEP, with a longer amount of time decreasing the likelihood of attrition. The MOS assignments of Infantryman and Cannon Crewman were found not to be sensitive to changes in DEP length, while Multichannel Communications Equipment Operator and Utility Helicopter Repairer were found to be highly sensitive to changes in the length of DEP. Hispanics had lower attrition than Whites in only four MOS assignments, while Blacks had lower attrition than Whites in nine MOS assignments. Implications of these findings were that DEP served as a “motivational screening device” (p. 17) for recruitment and had significant effects on lowering attrition. These results advocated for an effort to be made to maintain or increase the use of DEP.¹⁰

Nelson, A. & Kearl, C.E. (1990). *Delayed Entry Program (DEP) attrition: A microdata model* (ARI Technical Report 889). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A223 800)

Expanding on previous research, this report sought to identify the factors affecting attrition from the DEP in an effort to provide a foundation for policy-making. The impact of personal characteristics, recruiting policies, and economic factors on DEP attrition was assessed using a logistic regression analysis. The sample included Army Soldiers who enlisted in FY 1986 and FY 1987. It was found that as economic conditions in the civilian job market improved, DEP attrition increased. Increasing enlistment incentives and providing job training had an impact, though small, on reducing DEP loss. Also, longer time spent in DEP (more than four months) was found to increase attrition. Finally, recruits who were younger than their peers in the Army, had dependents, were Black, male, and had a high school diploma had the lowest risk of leaving the DEP. The authors suggested that this research could be further expanded to include policy suggestions on how to reduce the cost of DEP losses and to explain the reasons for gender differences in DEP.

¹⁰ This report followed an earlier report on the DEP, which looked at the costs of attrition in 12 MOSs: Manganaris, A.G., & Chester, P.E. (1985). *Delayed Entry Program: A policy analysis*. Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A167 847)

Ross, R.M., Nogami, G.Y., & Eaton, N.K. (1984). *The impact of occupational specialty and Soldier gender on first-tour enlisted attrition* (ARI Technical Report 627). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A163 502)

This research was performed to determine the impact of individual characteristics (e.g., gender, term of service, and education) and organizational variables (e.g., MOS assignment) on Army attrition. All female Soldiers and 10% of all non-combat male recruits entering the Army in FY 1976 were sampled. The data were taken from the DMDC 1976 Enlisted Cohort Data Base.

The amount of attrition varied based on such factors as gender, race, education, and the degree to which the MOS was considered to be traditionally male. High school graduation was found to be the best predictor of first tour completion. Females had the highest attrition rates, mainly due to Family-related causes (e.g., pregnancy), whereas males left due to adverse causes (e.g., problems with police). These are interesting findings, as the females had high aptitude scores and were more likely than males to have high school diplomas.

Of all females, those in MOS assignments that were non-traditional female MOS (such as Wire Systems Installer/Operator or Ammunition Specialist) had higher attrition, and Black females had lower attrition than White females. Blacks in non-combat MOS assignments had lower attrition than Whites in these jobs. The rates of attrition across different MOS assignments varied greatly, implying that more research should be done in this area. The authors also suggested that future research examine Family environment factors and nontraditional MOS assignments affecting female attrition, as well as reasons for racial differences in attrition.

Schroeder, J.E. (1984). Attribution and attrition in the U.S. Army Basic Training. *Journal of Psychology*, 117(2), 149-157.

This article discussed an experiment that was based on attribution theory and focused on the attitudes of Soldiers being discharged from basic training as compared to those successfully completing such training. Attribution theory states that a person who has failed at something would report that their failure was due to factors beyond their control, while outsiders would see the person's failure as caused by dispositional factors, within their control. In order to evaluate the need for counseling in basic training, attribution theory was used to predict that those attriting from basic training would report a higher frequency of socially acceptable counseling problems (e.g., Family or health problems), while successful trainees would report a higher frequency of socially unacceptable problems (e.g., alcohol problems or fear).

Interviews were held with 149 successful trainees from July through August of 1980 at Alpha and Delta Companies, Sixth Battalion, Infantry Training Brigade at Fort Benning, Georgia. Data on 57 attritees (recruits discharged from training) were collected between August 1980 and March of 1981 from the Training Discharge Program (TDP) of all eight

Battalions, at the same Infantry Training Brigade. As hypothesized, successful trainees expressed more problems that were low in social acceptability and attritees expressed problems higher in social acceptability. The author also discovered that those intending to leave for legitimate reasons, outside of their control, were more easily stopped from leaving than those leaving for more socially unacceptable reasons.

Sipes, D. E., & Laurence, J. H. (1999). *Performance data modeling: An examination of first-term enlisted attrition in relation to gender and training format. In Congressional Commission on Military Training and Gender-Related Issues: Final Report (Vol. 4) (pp. 577-661). Alexandria, VA: Human Resources Research Organization.*

These authors were concerned with the impact that gender-integrated training had on attrition from the military services. Data on FY 1991 through FY 1996 enlistment cohorts from all military services were obtained from the DMDC. The authors focused on 12-month attrition in the Army sub-sample and found that attrition remained fairly constant over time, aside from the increase between 1992 and 1993 from a 15.6% attrition rate to 17.5%. Attrition for women was consistently 10-15% higher than that for men. Given the similarity in attrition during the gender-segregated and gender-integrated training years, it was concluded that there was no relationship between gender-integrated training and attrition in the Army.

Warner, J.T., & Solon, G. (1991). First-term attrition and reenlistment in the U.S. Army. In C.L. Gilroy, D.K. Horne, and D.A. Smith (Eds.), *Military compensation and personnel retention models and evidence (pp. 243-280). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.*

These authors examined factors affecting first-term survival and reenlistment in the Army. Data on a sample of 30,355 enlisted men with three or four year contracts, between the years 1974 and 1983, were obtained from the Career Management Field 11 (Infantry). A random sub-sample of 10,000 enlistees from the sample of 30,355 was taken to determine the effects of different variables on attrition.

High school graduates, minorities, and those spending a longer time in DEP were much more likely to finish their first term. Also, MOS 11H and 11M¹¹ had comparatively high survival rates. Those recruits that were married upon enlistment or that received an entry under waiver were more likely to fail to complete their first term. Age, however, was not found to have an effect. Only when controlling for DEP length, high school graduation, and mental group, did economic variables (e.g., pay, benefits and unemployment rate) have an effect, though limited, on attrition. Finally, the probability of attrition during the first term was the highest in the second year for both three- and four-year enlistees.

¹¹ In 1991, 11H was Anti-Armor Specialist, but has since been reclassified as 11B, Infantryman. Similarly, 11M was Mechanized Infantryman, also now classified as 11B infantryman.

Zimmerman, R.A., Zimmerman, D.C., & Lathrop, M.E. (1985). *Study of factors related to Army Delayed-Entry Program attrition* (USAREC Study Report 85-3). Fort Sheridan, Ill.: US Army Recruiting Command, Program Analysis and Evaluation Directorate, Research and Studies Division. (AD A166 894)

This research effort focused on the personal and situational factors influencing attrition from the DEP and attrition within one year of DEP completion. Data were retrieved from Military Enlistment Processing Command (MEPCOM) files and the DMDC. Telephone interviews were held for additional information. The sample included 1,000 recruits entering the DEP in FY 1984.

Dissatisfaction with occupational assignment, the decision to return to school, and the expectation of finding a civilian job were major reasons for leaving DEP, especially during the first six months. Also, experiencing a change in attitude was a major reason for leaving DEP, and this was often a result of the recruiter not providing enough information on Army benefits, a dissatisfaction with job assignment, recruits' perception of too many demands being put on them in DEP, recruits' belief that they could find a better civilian job, and discouragement of enlistment by friends and Family.

Demographic variables and length of time in DEP were not found to be related to attrition in Active duty. Having a good relationship with the recruiter was found to increase DEP retention; attending DEP activities was found to increase retention in the first year of Active duty; and a change in military job was found to increase DEP attrition, but not attrition from Active duty.

These findings imply that recruiters should make more effort to provide realistic information to recruits on what they should expect from a job assignment, maintain good relationships with recruits, and plan activities for recruits, from which they can learn more about the Army and become more motivated. Future research should focus on a cost-benefit analysis which takes into account the extra time that would be needed from the recruiters for these improvements. Finally, DEP was found to be more of a socializing mechanism than a screening mechanism.

ATTRITION AFTER TRAINING

Attrition continues to occur after a recruit has completed IET. After such training, Soldiers may leave before they actually enter their units or during their time in units. The studies in this section concentrated on identifying both Soldier characteristics and organizational factors that are correlated with attrition from active duty service.

Many of the authors in this section agreed on the characteristics that are associated with attrition during this stage of enlistment. Mael and Ashforth (1995) were concerned with the biographical characteristics of Soldiers that make them a better fit for the Army. Having a stronger commitment to the Army, having a greater ability to work well in groups, and not having a delinquent history were some of the characteristics of Soldiers that were less likely to leave service prematurely. Blacks, non-high school graduates, Soldiers in combat MOS, and Soldiers with discipline and delinquency problems were consistently found to have higher attrition rates (Buddin, 1981; Hogan, Smith, & Sylwester, 1991; Mael & Ashforth, 1995; Manning & Ingraham, 1980; Orend, 1984). Unlike the studies in the previous section, where attrition from DEP was studied, these authors consistently found that having participated in the DEP and having spent a longer amount of time in the program reduced the chance of attrition after training (Buddin, 1981; Hogan, Smith, & Sylwester, 1991; Hosek, Antel, & Peterson, 1989).

Some of these authors were interested on the impact that the Army, as an organization, has on attrition. Alderks (1998), for example, looked at the effect of being deployed on Soldiers' attitudes and intentions to remain in the Army. Sticha, Dall, Handy, Espinosa, Hogan, and Young (2003) were interested in the effects of the Army Continuing Education System (ACES) programs on attrition and concluded that offering these programs promoted retention. Conversely, Hogan, Smith, and Sylwester (1991), studied the impact of the Army College Fund (ACF) on attrition and decided that enlistment bonuses had a stronger positive effect on keeping Soldiers than did educational bonuses, such as the ACES.

Individual characteristics as well as Army programs and deployments all can have an impact on attrition. The demographic characteristics that are associated with higher attrition tended to be constant over time, before, during, and after training.

Alderks, C. (1998). *PERSTEMPO: Its effects on Soldiers' attitudes* (ARI Study Report 98-02). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A351 766)

This report was done to determine the impact of PERSTEMPO (the extent of time Active Duty Soldiers are away from their home station), on the attitudes and career intentions of Active duty Army enlisted Soldiers and officers. This had become a concern, as there had been a decrease in personnel and resources along with an increase in missions. In this research effort, data were analyzed from the Sample Survey of Military Personnel from each spring administration between 1994 and 1997. It was predicted that the increase in missions could have a negative impact on retention,

readiness, and morale, but no statistical significance between Soldier retention and the amount of time spent away from duty station was found. However, the more time members spent away from their duty station, the less likely they were to report satisfaction with the amount of time they were apart from their Family, and this was increasingly one of the most significant reasons for thinking about leaving the Army. Although there was no strong evidence of the negative impacts of PERSTEMPO and the sample survey was not designed for the purpose of studying the effects of PERSTEMPO, these results could be used by policy makers in the consideration of future plans to deploy, train, and retain Soldiers.

Buddin, R. (1981). *The role of service experience in post-training attrition in the Army and Air Force*. Santa Monica, CA: The RAND Corporation.

This research examined the variables correlated with post-training attrition of male Army and Air Force members. The FY 1975 Cohort File, obtained from the DMDC, was analyzed using a multivariate attrition model to determine possible reasons for high rates of attrition in the recently established AVF. High school graduates were found to have much lower post-training attrition than non-graduates. Recruits that participated in DEP had lower attrition than those that did not, and this varied by occupational assignment. Married Soldiers were less likely to leave early, although Soldiers with children had a greater risk of attrition. Air Force personnel, of all occupations, stationed in Europe or the Pacific were less likely to leave, although duty location did not have the same uniform effect across Army MOS. Recruits under age 18 had a greater likelihood of leaving, especially in the Army. In the combat arms MOS, unlike in other MOSs, recruits with lower mental test category and Whites had the lowest attrition.

Since individual characteristics had similar effects on attrition in all MOS, the author concluded that assigning recruits to MOS based on these characteristics may not be justified. However, the author suggested the possibility of screening recruits, upon enlistment, for individual characteristics that may identify them as high risk. Additionally, more focus should be placed on reducing attrition at the locations with higher attrition (such as Continental United States [CONUS] locations versus non-CONUS) and in the MOS with comparatively higher attrition rates.

Hogan, P.F., Smith, D.A., & Sylwester, S.D. (1991). *The Army College Fund: Effects on attrition, reenlistment, and cost*. In C.L. Gilroy, D.K. Horne, and D.A. Smith (Eds.), *Military compensation and personnel retention models and evidence* (pp. 317-354). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

These authors were interested in determining the effects of the ACF on attrition and reenlistment in the U.S. Army. Data on a sample of 8,089 accessions in FY 1982 were analyzed through 1987. Recruit files from the U.S. Army Finance Accounting Center (USAFAC) were combined with files from the Veteran's Administration. Those who were eligible for the ACF program were found to be less likely to reenlist, though this effect was nonsignificant. Meanwhile, AFQT scores were found to have a slight impact on

attrition, with those scoring higher having more success in completing their first term, though this relationship was also nonsignificant. Recruits spending more time in DEP had significantly less chance of attrition. Soldiers in combat arms occupational specialties had higher attrition and Blacks had lower attrition than other groups. The authors suggested that, in order to apply these results, more educational bonuses should be offered in those MOSs needing more recruits. In order to increase the retention of Soldiers, enlistment bonuses were likely to have a more positive effect than educational bonuses and would be less costly.

Hosek, J.R., Antel, J., & Peterson, C.E. (1989). *Who stays, who leaves? Attrition among the first-term enlistees*. Santa Monica, CA: The RAND Corporation.

The authors of this document were interested in determining the factors that impact enlistment and first-term attrition in the AVF. Data on 4,718 enlistees were retrieved from the 1979 DoD Survey of Personnel Entering the Military Service. The 1979 National Longitudinal Study of Labor Market Behavior Youth Survey also provided data on 1,129 non-enlistees, for comparison. Attrition was examined at the six- and 35-month points of enlistment.

Education, months in DEP, and employment stability were strongly correlated with attrition. High school graduates had higher attrition rates than high school seniors at each of the points in the enlistment term examined and this relationship was especially strong at the 35-month point. Graduates and seniors were less likely to leave during their first-term if they anticipated furthering their education. Recruits who were found to have fewer opportunities in the civilian labor market, due to lack of the necessary qualities to succeed, had higher attrition rates. However, these are also the youths that were more likely to enlist. An increased length of DEP, beyond one month, had a strong negative correlation with attrition. These findings can help with recruiting and attrition reduction strategies. The authors proposed the following: more information on recruits be collected at enlistment; recruits be given more information at enlistment; a minimum DEP length be considered for implementation; training and job performance be assessed for attrition management; more efficient separation codes be developed; and the effects of educational benefits be measured.

Mael, F. A., & Ashforth, B. E. (1995). *Loyal on day one: Biodata, organizational identification, and turnover among newcomers*. *Personnel Psychology*, 48, 309-333.

This research was concerned with the use of biodata (e.g., information about a Soldier's biography, or past experiences) to determine the organizational identification (OID) of Soldiers, which was expected to have a large influence on attrition. A sample of 2,535 recruits at Ft. Leonard Wood, Missouri, including 1,082 Active duty recruits, was surveyed in 1991. Attrition was measured at six points during enlistment, between six and 24 months. Results showed that OID, or the inclination of Soldiers to identify themselves in terms of their membership with the Army, had a strong influence on attrition. Soldiers who perceived their interests to be similar to those of the Army, who had a preference for group and goal-oriented lifestyles, and who did not have a

delinquent history were more likely to identify with the Army. Also, Soldiers were least likely to leave if their fathers were supportive of their military service, if they attended many religious events during elementary school, and if they did well on little sleep. Of the variables that were included in the investigation, pastimes involving the outdoors, machinery, or livestock had the weakest relationship with attrition, although these variables were strongly related to OID. Soldier ability to function in a groups or teams had the strongest relationship with attrition.

Manning, F.J., & Ingraham, L.H. (1980). Personnel attrition in the U.S. Army in Europe. *Armed Forces and Society*, 7(2), 256-270.

This research focused on first-term recruits that completed basic combat training, but left the Army before reaching their first unit. The data were obtained from personnel records, collected from 649 personnel stationed in Europe. Of the 649 data files, 58 Soldiers who were discharged before the end of their tour were interviewed.

In general, the discharges were found to be younger and of a lower rank than successful recruits. Dischargees were also more often White than Black and most were without a high school diploma. The Infantryman MOS had the largest number of discharges, but when considering the junior enlisted the food service and combat engineering fields had the largest number of discharges. Most of the dischargees had been disciplined previous to their discharge. The largest proportion of discharges went through the expeditious discharge program and/or the drug and alcohol rehabilitation program. Discharges of female recruits were most often due to marriage or pregnancy. The Soldiers that were interviewed and had been discharged saw leaders as unsupportive, thought that the Army would be a learning experience, favored the BCT portion of the service, and did not feel integrated into the community. Many of these dischargees expressed the desire to return to the Army. The authors suggested that the problem of attrition was embedded in the system and the way in which the system functions. It was recommended that the leadership and segregation issues be addressed.

Orend, R.J. (1984). *The effect of tour length and term of enlistment on attrition in USAREUR* (ARI Research Note 84-98). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A148 311)

These authors were concerned with the relationship that both tour length and term of enlistment had with attrition in the United States Army-Europe (USAREUR). The authors hypothesized that Soldiers enlisting for shorter terms were less likely to separate early. Data, on a sample of 41,991 first-term USAREUR recruits arriving between May 1979 and May 1980, were obtained from the USAREUR personnel transaction files and Department of the Army (DA) Military Personnel Center (MILPERCEN) Enlisted Master Files.

The authors distinguished between negative attrition, which resulted from performance failure, and neutral attrition, which was not explicitly related to performance, but could

still be related to being stationed in USAREUR. The losses for the 13th through the 18th month occurred at about the same rate as during the first year. However, during the next 6 months there was a substantial slowdown in loss rates. The ratio of neutral to negative losses remained the same in all the periods. The highest negative attrition rates occurred for three year enlistees. Two-year enlistees had a somewhat lower rate, and 4 year enlistees had the lowest rate of all. There were only very small differences across terms of service for neutral losses.

Men had more negative and less neutral attrition than women. Married service members, non-blacks, non-high school graduates, and Soldiers in combat MOSs had higher attrition. Recruits between the ages of 18 and 20 had lower attrition than those of other ages. Mental aptitude and being a high school graduate were negatively correlated with attrition. Also, those in the low AFQT category of IV were most likely to separate early if enlisting for a two-year term.

Because individual Soldier characteristics were associated with attrition early in the tour, the authors concluded that tour length only accounted for some, not all, of the variation in attrition. The authors concluded that assigning recruits to shorter tours would slightly reduce attrition. Although the cost-benefit of reducing USAREUR tour length was not calculated here, the authors proposed that the result would likely be positive.

Sticha, P.J., Dall, T.A., Handy, K., Espinosa, J., Hogan, P.F., & Young, M.C. (2003). *Impact of Army Continuing Education System (ACES) on Soldier retention and performance: Data analysis* (ARI Study Report 2003-02). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A415 373)

This report focused on the effects that the ACES had on first-term Soldier attrition, reenlistment, performance, and promotion. The ACES is made up of numerous sub-programs, such as the Tuition Assistance (TA) program, the Functional Academic Skills Training (FAST) program, the NCO Leader Skill Enhancement Courses, the Military Occupational Specialty Improvement Training (MOSIT) program, and the Armed Forces Classification Test (AFCT). The authors used a longitudinal administrative database that tracked a three-year accession cohort over a six-year period. The results showed that the effects of the ACES programs are positive. Specifically, participation in the TA program had significant positive effects on performance and promotion for NCOs and also increased reenlistment and first-term retention. Participants of FAST had a slight increase in reenlistment and a significant decrease in attrition. Overall, participation in other programs increased promotion points, especially NCO participation in the NCO Leader Skill Enhancement Courses and the MOSIT. NCOs participating in the AFCT took longer, however, to attain their rank. The finding that the TA program had positive effects on reenlistment contradicted the findings of past studies done on the Navy and Marine Corps.

THE FAMILY AND SOLDIER ATTRITION

The role of the military Family, its impact on Army life, and, ultimately, its effect on Soldier attrition has been the subject of an ongoing and consistently large body of research since the early 1980's. Mady Segal's "The Military and the Family as Greedy Institutions"¹² was a landmark study that revealed the growing conflict between the Family and the military service organization, as both institutions compete for a service member's commitment.

As the proportion of married military personnel increased, the military looked for ways to accommodate the personal needs of its "employees," as would occur in the civilian sector. These accommodations were made in order to retain its members, but also to ensure Soldier commitment, loyalty, and participation necessary to maintain a strong and ready military force. Consequently, aspects of the military Family, including attitudes towards military lifestyle, support of the service member, and quality of life, have a large bearing on recruitment, morale, and retention of military personnel. By the middle of the 1980's, 10 years after the advent of the AVF, it became very apparent that closer attention to the military Family and its role in the military organization was needed.

The Army Family Research Program (AFRP), conducted by the U.S. Army Research Institute, was carried out in response to a research requirement outlined in the Chief of Staff of the Army's 1983 White Paper. The program produced over 100 scientific and applied documents addressing and exploring the relationship between the Army and its Families¹³.

The research on the Family and attrition that is annotated here represents only a sample of the many pieces of research that were conducted under the AFRP as well as some other research. Most of the research on the link between the Family and military attrition was done in the 1990's. These studies focused on Family services and programs, such as the use and need for child care (Lakhani & Ardison, 1991), spousal satisfaction with military life (Rosen & Durand, 1995), and Family economic issues (Croan, et. al, 1990; Wood, 1990).

Theoretical models were built and tested to attempt to establish how and when Family matters impacted not only attrition, but career decision-making processes, and re-enlistment. Combat readiness and Family influences during Operation Desert Storm became significant topics of investigation in the mid-1990's (Rosen, 1995). The current war in Iraq and the continuing and rapid deployment of Soldiers is placing enormous strain on Soldiers and their Families, which will become explicit in future research. As recently as 2003, research by Burrell, Durand, & Fortado (2003), explored the integration of military spouses into the military community and the impact that this had on attrition.

¹² Segal, M.W. (1986) The Military and Families as Greedy Institutions. *Armed Forces and Society*, 13 (1), 9-38

¹³ Segal, M. W., & J.J. Harris. (1993) *What We Know about Army Families*. Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences. Contract No. DAAL03-D-0001.

In this section on the military Family, we have included a few examples of the research in this area of the Army Family.

Burrell, L., Durand, D.B., & Fortado, J. (2003). Military community integration and its effects on well-being and retention. *Armed Forces and Society*, 30(1), 7-24.¹⁴

These authors were interested in the way that Army spouses of the different Army components were integrated into the military community and the effects that this integration had both on reenlistment and on well-being of Soldiers and spouses. The different Army components were compared, as Reserve Component members had recently been performing similar duties to those performed by Active Component members. Surveys were administered to non-deployed Soldiers (Reservists, National Guard, and Active Component) and their spouses in the III Corps area. The National Guard had the most married Soldiers and the largest response rate of spouses, while the other components had low response rates.

The authors found that a smaller percentage of Active Component spouses than spouses of the other the Reserve Components preferred that their Soldiers (or spouses) stay in the service. The largest percentage of spouses desiring that their Soldiers remain in the service was found in the National Guard sample. Soldier age was significantly related to spouses' preference for retention. Spouses that were more integrated into the military community had more of a preference for their Soldiers to remain in the service. Active duty spouses were the most integrated into the community, though less so than expected.

Croan, G.M., Bowen, G.L., Farkas, G., & Glickman, A. (1990). *Career decision-making and the military Family: Toward a comprehensive model* (ARI Research Note 90-17). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A223 225)

These authors developed a model of the retention decision-making process that was used by Soldiers with Families. The model took into consideration the following: actual retention behavior, desirability of the Soldier to remain in the Army, satisfaction factors (e.g. satisfaction with job, culture, Family, community, and economic situation), environmental conditions, exogenous factors (e.g. policies and practices of the Army, individual and Family characteristics, and economic benefits), and spouse's influence on retention. Future research was recommended to specify and clarify this model. The authors also suggested that qualitative studies would be helpful in furthering the understanding of retention and improving this model. In addition, a look at how Army life influences Family life would be useful. Finally, the model should be tested longitudinally and experiments with interventions should be performed, based on the results of this research (such as the development of youth-oriented programs).

¹⁴ Although this research focuses on reenlistment, which was not the intended purview of this bibliography, it was believed that the influence of the Family on the well-being of the Soldier is so important that this citation as well as that of Rosen and Durand should be included to provide a source for those interested in the topic.

Griffith, Janet, Rakoff, S.H., Helms, R. F. 1992. *Family and other impacts on retention*. (ARI Technical Report 951) Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences), (AD A253 449).

This report was another in the series from the AFRP. It examined the impact of Army Family and other factors on whether quality Soldiers intended to remain in the Army as a career. Data were obtained for a sample of 11,035 Soldiers serving in Active Army units throughout the continental United States as well as overseas. The research looked at Soldier and Family characteristics as they related to retention, reasons Soldiers enlist in the Army and their career plans at the time they had entered the Army, and how Army and Family factors affected retention and career plans. Analyses found that as Soldiers moved through their Army careers and made long-term investments and commitments to the Army, job security and long-term commitment offset some of the downside factors of Army life, such as less personal freedom and the conflict that could arise between Family and work commitments. It was found that as time progressed, the Soldier had an increased tolerance for Army work requirements and lower levels of personal freedom.

Lakhani, H. & Ardison, S. (1991). *The determinants of child care use and retention in the U.S. Army* (ARI Technical Report 945). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences. (AD A246 161)

This report examined the relationship between child care use and Army retention. Spouses of officers and enlisted Soldiers were sampled using the 1987 Annual Survey of Army Families. The authors discovered that Families of officers tended to use formal child care, whereas Families of enlisted were more likely to use informal child care. There was found to be a positive relationship between child care use and the following: spouse employment, Soldier rank, spouses' time spent in volunteer activities, and number of months at current post. A greater use of child care was found to be associated with a greater spousal desire for the Soldier to remain in the service. Based on these findings, the authors suggested that child care services continue to be offered by the Army and that lower ranked Soldiers should be charged less for child care, as they are less likely to be able to afford formal child care.

Rosen, L.N., & Durand, D.B. (1995). The Family factor and retention among married Soldiers deployed in Operation Desert Storm. *Military Psychology*, 7(4), 221-234.

These authors studied the Family influences on retention and reenlistment of married junior enlisted Soldiers and NCOs deployed during Operation Desert Storm (ODS). The research effort addressed the concern that the Family may negatively impact Soldiers' readiness and retention. Self-administered questionnaires were distributed to 1,274 spouses of deployed Army Soldiers during ODS, from January to April of 1991, and then again one year later to 776 spouses of the original sample, from January to April 1992.

Unrealistic expectations of what the Army could do to assist Families of deployed Soldiers, rather than stress, was a major predictor of retention following ODS among junior enlisted. A majority of junior enlisted Soldiers who remained in the Army after ODS had spouses with no more than 5 years of experience as a military spouse. In contrast, the majority of NCOs who *left* the service also had spouses with no more than 5 years of experience as a military spouse. When spouses perceived that there was compatibility between the Army and the Family, as measured by the Army/Family Interface scale, junior enlisted Soldiers were more likely to remain in service immediately after ODS. Additionally, higher ranked NCOs were more likely to stay in the service also due to perceived compatibility. Divorce and spouse's wish for the Soldier to leave or stay in the Army were better predictors for NCOs than for junior enlisted. Also, the reenlistment decisions of NCOs were more likely to remain stable over time than decisions of junior enlisted.

Vernez, G., & Zellman, G. (1987). *Families and mission: A review of the effects of Family factors on Army attrition, retention, and readiness*. Santa Monica, CA: The RAND Corporation.

These authors compiled a review of the literature on Army attrition, retention, and readiness in an effort to enhance Army policies regarding the Family and identify areas for further research. The literature revealed that service members with spouses or young children were more likely to leave the service during the first term. The importance of the Family appeared to vary by branch and rank (e.g., officer vs. enlisted) and increased with the member's length of service. Many attritees reported that their spouses were dissatisfied with the frequent relocations and separations in the Army. Negative attitudes of the Family towards the military job were found to reduce retention, and working wives were found to be least supportive of the unpredictability of military life. The support of member's supervisor, strong peer relationships, and satisfaction with military career by both the member and the Family led to decreased attrition. The perception of job opportunities in the civilian job market had also been found to have an effect on retention decisions. Studies on the effects of services provided by the Army to members and Families, however, did not offer consistent results.

Wood, L. 1990. *Family economics and the retention intentions of Army Enlisted personnel*. (ARI Research Note 90-68). Alexandria, VA.: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A226 448)

As part of the AFRP, this research attempted to contribute to the literature developing a household decision framework with the Family as the unit of analysis. It incorporated both economic and non-economic factors into the same model. The focus was on the links between economic factors, the non-monetary aspects of Army life, spouse satisfaction with Army life, and the members' retention intentions. Data came from the 1985 DoD Surveys of Enlisted Personnel and Military Spouses. The sample was composed of 4,073 Soldiers and 6,677 wives of enlisted Army personnel. The author found that Family economic factors, including spouse employment, member wages, and receipt of food stamps are important in the determination of Soldier retention intentions.

WAIVERS AND DISCHARGES

According to AR 601-210 (16 May 2005) "...applicants who do not meet established enlistment standards are not eligible for enlistment unless a waiver is authorized." Some of the typical offenses or reasons for disqualification that lead to the need of a waiver include a record of having six or more minor traffic offenses, two to four misdemeanor offenses, carrying a weapon on school grounds, possession of illegal drugs on school grounds, as well as many other types of offenses. There are also medical standards that a potential recruit may not meet, but nonetheless may be able to enlist if provided with a waiver. The receipt of waivers for admission into the Army is a concern, as those being allowed to enlist despite problems encountered during screening are suspected to be at the greatest risk of attrition. Research on waivers has been primarily concerned with the receipt of moral waivers, and how granting these waivers may result in a greater amount of attrition (Fitz & McDaniel, 1988; Putka, Sipes, & Ramsberger, 2002).

This section includes important findings regarding the effect that waivers and discharges have on Soldier attrition. The attitudes and expectations of recruits have had an impact on their receipt of a discharge from training (Trainee Discharge Program Study Group, 1984). Furthermore, those receiving moral waivers were most likely to receive unsuitability discharges (Fitz & McDaniel, 1988). Some of the findings varied by gender, as women have been found to be most vulnerable to attrition when receiving moral waivers (Putka, Sipes, & Ramsberger, 2002). However, the most recent research in this section revealed that, of all the military services, the Army had the most success in avoiding attrition of Soldiers who had received moral waivers (Putka, Sipes, & Ramsberger, 2002).

Fitz, C.C., & McDaniel, M.A. (1988). *Moral waivers as predictors of unsuitability attrition in the military* (PERS-TR-88-006). Monterey, CA: Defense Personnel Security Research and Education Center. (AD A210 160)

These authors were interested in the relationship between the receipt of moral waivers and the receipt of an unsuitability discharge. The data included all recruits enlisting during FY 1982 for each military service. The findings revealed that recruits receiving moral waivers were more likely to receive unsuitability discharges, in all services except the Marine Corps. Recruits most likely to receive moral waivers were men, Whites, those with higher AFQT scores, and those without a high school diploma. Recipients of misdemeanor waivers, which were extremely common in the Army and the Air Force, were more likely to receive unsuitability discharges in all services than those receiving other types of waivers. In the Army, this relationship was strongest for males, Blacks, and recruits with a low mental category. The relationship was stronger for high school graduates in all of the services.

Based on these findings, moral waiver status appeared to be a good predictor of attrition. More research on the effects of moral waivers for recruits in sensitive jobs was recommended. Perhaps the services would all benefit from adopting the policy of the

Air Force, in which recruits receiving moral waivers were not assigned to the more sensitive jobs.

Putka, D. J., Sipes, D. E., & Ramsberger, P. F. (2002). *An evaluation of moral character waiver policy against 3-month attrition (FR-02-45)*. Alexandria, VA: Human Resources Research Organization.

These authors concentrated on the association between receiving waivers in military moral character screening (which evaluates pre-service criminal behavior and drug/alcohol abuse) and three-month attrition. Each service's distinct waiver policy was assessed, although data on attrition were not available for the Air Force. The research sample included 42.6% of all service members beginning their service between June 1, 2001 and September 30, 2001. Data were retrieved from DMDC, and more detailed information on members was retrieved from self-reported Electronic Personnel Security Questionnaires (EPSQ).

The authors found that 7% of Marine Corp accessions and 8% of Army and Navy accessions who received moral waivers left the military service within three months. The moral waiver policy of the Army was least detrimental on the rate of attrition, while receipt of moral waivers most strongly predicted attrition from the Navy. In general, women with waivers were found to be more likely than men to leave within three months, while there was no association between receiving waivers and three-month attrition for male recruits. The following recommendations were made for moral character waiver policies: classification of law violation should be standardized among the services and this change should be clarified in recruiting manuals; there should be a reconsideration of the use of moral waivers in light of these findings and an evaluation of criteria for approval of waivers by authority figures; further research should look at attrition beyond the three-month point as it relates to receipt of moral waivers; and there should be a consideration of the use of EPSQ data in addition to what is currently used in assessing individuals' qualifications for service in the military.

Trainee Discharge Program Study Group. (1984). *A review and analysis of the Army's Trainee Discharge Program*. Fort Monroe, VA: United States Army Training and Doctrine Command.

This report was prepared as an assessment of the Army's TDP - Trainee Discharge Program, which had served as a relatively honorable form of discharging Soldiers that were clearly unfit for IET. The report presented the finding that, overall, the TDP was effective in identifying recruits that were most likely to fail. The report contained an extensive list of causes of assignment to TDP, including trainee factors, USAREC factors, MEPCOM factors, and training base factors. TDP and measures of recruit quality were found to be unrelated, as high quality Soldiers did not have lower TDP rates. Also, improvements and updates in keeping track of TDP rates were recommended. Trainee attitudes and expectations were found to have a big impact on TDP rates.

JOB CHARACTERISTICS, MOS, COURSES, AND ATTRITION

The research included in this section dealt, primarily, with attrition across MOS assignments, specific military courses, and related job characteristics. For example, marital status has a different effect on attrition depending on the MOS, while other demographic characteristics are consistently associated with attrition across all MOS (Baldwin and Daula, 1985). Of all NCO courses in the Army, the Special Forces Medic Course (SFMC) suffers the greatest amount of attrition (Graham, 1994). Other authors directed their attention to attrition from the Special Forces Qualification Course (SFQC) (Diana, Teplitzky, & Zazanis, 1995), the U.S. Army Medical Department pharmacy specialist training program (Meadows, Stanton, Styles, & Finstuen, 2002), and the Defense Language Institute Foreign Language Center (DLIFLC). These authors made recommendations on how to reduce attrition in these courses (Graham, 1994; Whelan, 2001).

Certain characteristics of the Army job may lead Soldiers to attrite. Rosenthal and Laurence (1988) attempted to identify these job characteristics. These characteristics, such as job complexity, demands on strength, and undesirable conditions, were found to be indirectly related to attrition, but to lead to the decision to separate early from service.

The following studies reveal, in greater detail, the type of research that was done on attrition from specific areas of the military, since the eighties.

Baldwin, R.H., & Daula, T.V. (1985). Army recruit attrition and force manning costs: Methodology and analysis. *Research in Labor Economics*, 7, 311-338.

These authors were concerned with the costs of maintaining the size of the Army during a time of increasing attrition rates, due in part to the appeal of the civilian labor market. The DMDC files for FY 1976 through FY 1978 cohorts provided the sample of Soldiers. The authors analyzed the MOS assignments of infantry Soldiers, vehicle operators, and clerks.

Accessions with a higher AFQT score and a high school diploma were less likely to leave. Females were found to have the highest attrition, especially in the vehicle operator job. Non-whites had a better survival rate than Whites across the MOS assignments. Also, Soldiers that had participated in DEP were less likely candidates for attrition. In the infantry MOS, married Soldiers were more likely to leave, whereas married Soldiers who were in the clerk MOS were more likely to stay in the service. In these two jobs, longer time spent in the labor market prior to enlistment seemed to imply a worse ability to adapt to Army life. Also, in infantry and vehicle operations, higher unemployment rates in the civilian labor market and longer periods of enlistment were associated with less attrition, while the opposite was true for clerks. Receiving a bonus did not seem to have an impact on attrition. The authors ultimately concluded that it would be cheaper to manage the force with the exclusive recruitment of high quality

candidates. Although this would decrease the number of recruits, the expected subsequent drop in attrition and increase in reenlistment might prove beneficial.

Fernandez, R.L., & Garfinkle, J.B. (1985). *Setting enlistment standards and matching recruits to jobs using job performance criteria*. Santa Monica, CA: The RAND Corporation.

These authors were concerned with the enlistment of quality recruits in the four Army jobs of Infantryman (11B), Multichannel Communications Equipment Operator (31M), Tactical Wire Operations Specialist (36K), and Medical Specialist (91B). Data on enlistees during FY 1977 through FY 1981 were used in the analysis, in order to include recruits enlisting both before and after the ASVAB standards were changed. The changes were made in 1980, in order to fix a problem that was discovered and to raise recruit standards.

The greatest amount of attrition in all four MOSs occurred in the first five months of enlistment, especially during BCT. High school graduates were found to be more likely than non-graduates to complete their term. Retention rates at 29 months of enlistment were significantly higher among recruits in the MOS 91B and 36K and among high school graduates, with others having higher rates of attrition. Blacks were found to have lower attrition than Whites, particularly during training, and females had higher attrition than males. Aptitude was not predictive of attrition in this sample. The authors used a measure of recruit quality which included the occurrence of attrition. Using this measure they determined that quality was higher in FY 1981 than in FY 1977 through FY 1980. During that period there were more high school graduates and recruits who had scored higher on the AFQT. AFQT scores were concluded to be more important than education in predicting performance. Further study should determine the weight of the benefits against the costs of increasing the standards of recruits, the importance of performance across jobs, and whether it would adequately reduce the number of recruits while increasing their quality.

Graham, S.E. (1994). *Analysis of Special Forces Medic (18D) attrition* (ARI Research Report 1665). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A285 659)

The Special Forces (SF) Medic training course is a difficult and intensive course and has what is probably the highest attrition rate of all NCO courses in the Army. The purpose of this report was to study the possible causes of attrition from this course and to provide recommendations to reduce attrition and improve the course. One hundred interviews were conducted and two different questionnaires were administered to assess selection, training, evaluation and standards for students, instructors, and SF medics. The interviews also assisted in the assessment of the intention of medics to leave the course (as determined by a questionnaire in FY 1992).

From FY 1989 to FY 1992, attrition in the Special Operations Medic Sergeants Course (SOMED) increased from 38% to 53%, although the number of graduates also

increased from 55 to 130. The Special Operations Proponency Office estimated that 10% of the students in the SF medic qualification course (18D) were lost annually. Based on the results of the interview, training appeared to be one of the most important reasons for attrition: training was done in a short period of time with too many tasks for the amount of time, and was extremely difficult. Another issue was the instructors themselves: some were civilians hired under educational services contracts and it was believed that they had inappropriate backgrounds and credentials. The ratio of student to teacher was a third cause of attrition: many of the tasks being learned were hands on and required close attention by the instructors. There had been an increase in the number of students, making this type of instruction difficult.

The author recommended the following changes to reduce SF Medic (MOS 18D) attrition: increase the number and quality of instructors, release poorly performing students earlier in the course, focus the training on frequently failed tasks, improve objectivity of the grading system, improve training facilities, consider the possibility of a pre-course as well as policies to reduce instructor burnout, and incorporate more computer-based training.

Manganaris, A.G., & Schmitz, E.J. (1984). *Projecting attrition by military occupational specialty* (ARI Technical Report 637). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A168 183)

These authors were interested in accurately predicting first-tour attrition, to explain the varying rates of attrition across MOS, and to assist in the development of policy changes that would successfully reduce attrition. MOS-specific attrition rates were developed for 76 MOSs across demographic groups. Using a sample of 76 MOS accounting for 118,262 accessions, multiple regression analyses were performed on Soldiers who entered the Army between January 1976 and September 1978. Eight demographic categories were analyzed, based on level of education, gender, AFQT score, and MOS assignment. Results showed that, of the 76 MOS categories, 88% had a 20% variation in attrition rate within various demographic categories. Overall, attrition for all MOS assignments ranged from 12% to 64%. Male recruits in MOS 67Y (Attack Helicopter Repairer), and those scoring in the highest AFQT group had the lowest attrition rates. The highest attrition was found among MOS 05C (Radio Teletype Operator) assignments, non-high school graduates, and recruits with AFQT scores in the lowest range (IIIB-IV). The largest difference in average attrition rates was found to be between high school graduates and non-high school graduates, with a significant difference also found between AFQT groups. Female attrition was less variant than was male attrition. It was also concluded that historical attrition rates can be explained by using data at the time of enlistment. Attrition can be predicted based on data available to recruiters prior to MOS assignment, such as recruit education, AFQT score, and gender.

Meadows, A.B., Stanton, B.K., Styles, J.R., & Finstuen, K. (2002). Predictors of course completion for the U.S. Army Pharmacy Specialist Course. *Military Medicine*, 167(2), 140-144.

This research identified variables that predict graduation or attrition from the U.S. Army Medical Department pharmacy specialist (MOS 91Q) training program. Records from a sample of 143 students enrolled in the course in FY 2000 were retrieved from the Pharmacy Specialist Course administrative office. Of this sample, 82% were Active duty and 78% graduated. Active duty service members and those in the rank of private were found to have the lowest completion rates. Other variables having a statistically significant relationship with completion were gender, cross-trainee, and the ASVAB general technical (GT) score. Unlike past studies, the GT composite score was not found to predict completion, though this score was used in admissions. Consistent with other studies, the ASVAB score was predictive of completion. These results can help with recruitment and with the identification of students at risk of failing to complete the Army Pharmacy Specialist Course so that these students may either be screened or given additional attention.

Rosenthal, D.E., & Laurence, J.H. (1988). *Job characteristics and military attrition.* (FR-PRD-88-11). Alexandria, VA: Human Resources Research Organization.

These authors attempted to identify the characteristics of military jobs that are related to attrition. They studied a sample of FY 1979 through FY 1983 enlistees, using existing data from the Department of Labor. Results indicated that attrition increased when the amount of training, cognitive aptitude requirements and complexity of work regarding the use of data decreases. Additionally, attrition increased when demands on strength and undesirable work conditions were more prevalent. The authors hypothesized that more mental challenge, or job complexity, was most strongly associated with lower attrition. The authors found that military personnel of both high and average quality, as ranked by AFQT score, left the services for these same job-related reasons, so efforts to address attrition can be aimed at both of these groups simultaneously. In conclusion, the authors proposed that job characteristics were not a direct cause of attrition, but that they were part of the psychological process leading to the decision to leave.

The authors recommended that future research focus on how military personnel obtain information on the availability of civilian jobs, as the perception of civilian job opportunities can lead to attrition. Also, studying the effect that increased job mobility has on decreasing attrition may be helpful in developing new policies in the services. The authors suggested that successful attrition interventions may include the following: changing the nature of work to be more satisfying, using personality traits in job screening, and targeting counseling at service members who may be considering leaving prematurely.

Teplitzky, M.L., & Zazanis, M.M. (1995). *Special Forces Qualification Course graduation and attrition statistics for Soldiers selected for training in FY89-FY91* (ARI Technical Report 1023). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A292 902)

The authors examined the graduation rates of Soldiers in order to assess the impact of attrition in the SFQC. A sample of 2,637 enlisted Soldiers in the course, between FY

1989 and FY 1991, was taken from the SFQC Longitudinal Database. The data analyzed included information on demographic characteristics and Soldiers' MOS. Overall, attrition rates increased during that period. Recycle rates (Soldiers making more than one attempt to graduate) were similar across the four Special Forces MOS. Graduation from medic training was lowest, especially for Specialists and Corporals. Combat arms trainees and higher ranked NCOs had the highest graduation rates. This research could help in predicting which Soldiers are likely to graduate and in developing guidelines for SFQC regarding attrition.

Williams, E. S., & Greenston, P.M. (2004). *Examining training eligibility standards: four case studies* (ARI Study Note 2005-01). Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A427 358)

This research effort assessed the effects that lowering enlistment standards would have on the attrition and the performance of Soldiers who were participating in training courses. Data on 8,016 Soldiers in four MOSs during 1999 and 2000 were retrieved from the Army Training Support Center (ATSC) and further information on Soldiers was retrieved from the Enlisted Master File. The MOS training courses that were analyzed were 14E (Patriot Fire Control Operator/Maintainer), 55D (Explosive Ordnance Disposal Specialist), and 55B (Ammunition Specialist), 77F (Petroleum Specialist). Included in the sample were students that had dropped out of the MOS training courses, students that completed the courses successfully, and students that were still enrolled in courses.

The authors found that the probability of passing, among high school graduates, would be reduced by 2% if the cut-off score of MOS 14E was reduced by 5 points. Correlation was found between having a higher Mechanical Maintenance (MM) composite score and passing the course. Additionally, male Soldiers with a high school diploma had a 15% increased chance of passing as compared to other male Soldiers, leading to the conclusion that having a high school diploma may be the best predictor of passing. The effect of the General Maintenance (GM) composite was found to be strong for Soldiers in MOS 55D, though the sample was too small to provide a basis for generalizing these results. The authors found it difficult to distinguish attrition related to academics from attrition for non-academic reasons in the MOS 55D sample or in all of the samples examined. It was suggested that more research needs to be done in order to affirm these results before new policies regarding lower enlistment standards are adopted.

Whelan, B.E. (Ed.). (2001). *Workshop on student language attrition* (ARI Study Report 2002-02). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A399 533)

This report discussed the outcome of a Workshop on Student Language Attrition, held at the DLIFLC. The workshop was held for the purpose of understanding the problem of attrition at DLIFLC, comparing DLIFLC attrition to that of linguists in other military services or to similar Army MOS and assessing possible remedies. Individuals from government agencies, academia, and contractor organizations attended the workshop

to listen to presentations of recent studies on attrition and to develop recommendations to reduce attrition.

To address the attrition problem, recommendations focused on improving conditions for the teachers and students. Improvements for instructors would include improving the flexibility of instruction scheduling and the training of faculty, in addition to certifying instructors more frequently. To improve the experiences of students, an increase in the number of instructors and academic advisors and an improvement in students' access to support (e.g., health centers) were recommended. To improve student quality, improvements in the strategies of assigning students to language courses and in language aptitude assessment (e.g., raising minimum language aptitude score) were suggested. Additionally, better preparing students prior to training was expected to reduce attrition. The development of a universal vocabulary and the sharing of information between military units and schools would also be beneficial. Finally, making more information available to recruiters and recruits on the online web site and upgrading the technology used for instruction and administration were perceived as improvements that would help decrease the rate of attrition from DLIFLC.

MEDICAL CONDITIONS AND ATTRITION

The majority of the research described in this section was concerned with how weight problems and mental disorders impacted attrition. Overweight recruits and those with mental problems have been found to be less likely to succeed in the military.

For example, Buddin (1989) and Laurence (1988) focused on weight and body mass standards in the military and how recruits that did not fall within the standards contributed to attrition. Overweight recruits were found, by both authors, to have an increased risk of attrition, although this was true only for males. Female recruits, on the other hand, faced much stricter standards and, therefore, had fewer weight problems.

The two articles focusing on mental disorders in the military concluded that Soldiers using health care services due to mental disorders had a greater chance of attrition than Soldiers receiving care for other illnesses (Hoge et. al., 2002; Hoge et. al., 2005). However, the research also concluded that it is difficult to screen for mental disorders during recruitment.

The following annotations represent studies done on weight and mental issues that may have an impact on attrition from the Army.

Buddin, R. (1989). *Weight problems and attrition of high-quality military recruits*. Santa Monica, CA: The RAND Corporation.

In this research, the author examined the effects that weight problems had on attrition of high quality recruits both during and after training in the military services. Logistic regression analyses were performed on data obtained from the DMDC of all non-prior service members in the accession cohorts of FY 1982 through FY 1985. Medically overweight men were found to have much higher attrition than those within the average weight range, especially in the Army and Marines and during basic training. The weight of women did not have a significant effect on attrition, probably due to the stricter weight standards for female recruits than for male recruits. Of the services, the Army was the only one for which weight had a significant effect on male attrition after training. Overweight male recruits were 1.25 times more likely to leave after training, as compared with three times more likely during training. This implies that unfit recruits are either weeded out during training or that fitness is less important for success after completion of training.

A possible solution for the high attrition due to overweight recruits could be the enforcement of tighter weight standards, but this would increase the cost of recruits and may be negated by higher attrition rates of recruits that are less educated who would likely replace those that are unfit. In the future, policies could be improved with more research that deciphers the reasons for overweight attrition. Changes in management and practices helped reduce the attrition of overweight men in the Army's FY 1985 cohort and this has implications for further changes in military policies.

Hauret, Keith, G., Knapik, J.J., Lange, J. L., Heckel, H., Coval, D. L., 2004. Outcomes of Fort Jackson's Physical Training and Rehabilitation Program in Army Basic Combat Training: Return to training, graduation, and 2-year retention. *Military Medicine*, 169(7): 562-567.

These authors addressed the effects of the Physical Training and Rehabilitation Program (PTRP) on the retention of Soldiers at Fort Jackson. Trainees in BCT who were injured and unable to continue, were assigned to the PTRP. The authors used a retrospective cohort designed to evaluate return to training and BCT graduation rates for those trainees who were in PTRP. The PTRP graduates were matched to non-PTRP graduates for purposes of examining 2-year retention rates in the Army. More PTRP women were discharged from PTRP than men. Of those who returned to Basic Training, 10% of the men and 12% of the women were discharged from the Army compared to overall Ft. Jackson discharge rates of 9% for men and 15% for women. Comparison to non-PTRP found no differences in 2-year retention rates for men or women. The authors noted that the BCT discharge rate for trainees who were rehabilitated from their injury was similar to the overall discharge rate at Fort Jackson. Finally, the 2-year retention for PTRP trainees who graduated from BCT was similar to that of non-PTRP trainees.

Hoge, C.W., Lesikar, S.E., Guevara, R., Lange, J., Brundage, J.F., Engel, C.C., et al. (2002). Mental disorders among U.S. military personnel in the 1990s: Association with high levels of health care utilization and early military attrition. *American Journal of Psychiatry*, 159(9), 1576-1583.

This article compared the effects of using health care services for mental disorders, as opposed to other medical illnesses, on attrition of Active Duty military personnel. The data on hospitalizations and ambulatory visits by military service members were collected by the Defense Medical Surveillance System between 1990 and 1999.

Mental disorders were the leading cause of male attrition from the military and the second leading cause of female attrition. Of the service members hospitalized for mental disorders in 1996, 47% left military service within 6 months, while a significantly lower percentage (12%) left the service within 6 months after being hospitalized for other illnesses. There was also a significant difference among those using ambulatory services, with 27% leaving due to mental disorders and 9% due to other illnesses. These significant differences remained when controlling for demographics and length of time in service. Therefore, it was concluded that diagnosis of mental disorders was an important predictor of attrition. Some implications may be that managed care strategies of the military are not effective for mental disorders as compared to other illnesses, especially due to the observation that mental disorders (primarily alcohol, substance use, personality, and mood disorders) became the second most common discharge category (based on the *Ninth Revision of the International Classification of Diseases*) in the 1990s.

Hoge, C.W., Toboni, H.E., Messer, S.C., Bell, N., Amoroso, P., & Orman, D.T. (2005). The occupational burden of mental disorders in the U.S. military: Psychiatric hospitalizations, involuntary separations, and disability. *The American Journal of Psychiatry*, 162(3), 585-591.

These authors examined the rate of attrition for Soldiers with mental disorders, as compared with Soldiers that have other illnesses. In order to assess the differences between these two groups, the authors used a sample of 13,971 U.S. Army, active duty Soldiers that were first hospitalized in 1998. Data were taken from the Total Army Injury and Health Outcomes Database. The authors found that separations for mental patients were much more frequent than for other patients. Within six months after their first hospitalization, 45% of patients with mental disorders as their primary diagnosis separated, 27% of patients with mental disorders as a secondary diagnosis separated, and 11% of patients with other illnesses separated. A multivariate analysis revealed that younger, single, Caucasian Soldiers with a shorter duration of service and a lower rank are the most likely to separate prematurely, but that education and gender were not significantly correlated with attrition. Most mental patients that separated did so involuntarily. Those with psychotic, mood, and anxiety disorders were more likely to be separated due to medical discharge and disability, while those suffering from substance use, maladjustment, and personality disorders were more likely to be discharged for other reasons. It was also found that, for mental patients, there often existed evidence of their disorders prior to enlistment, yet the authors concluded that it is difficult to screen for mental disorders.

Laurence, M.T. (1988). *Enlistment height/weight standards and attrition from the military*. Arlington, VA: Defense Manpower Data Center.

This author addressed the concern that overweight military recruits have a higher attrition rate than those who are not overweight. The research sample included non-prior service accessions of the FY 1983 through FY 1986 cohorts. To control for the variation in weight standards across the services, the author defined overweight as being 20% above the mean weight of the general population (referred to as “the 120% of mean body-mass standards”). The weight standards used by each service were found to be more restrictive for females than for males and many recruits (especially female recruits) were granted waivers of the standard.

Overweight recruits, under the current weight standards, had higher attrition than qualified recruits (e.g., recruits within the weight standards). Using the 120% of mean body-mass standards, overweight recruits also had higher attrition than those who qualified. However, an overweight recruit, who was still under the 120% of mean body-mass standards, with a higher AFQT score (in the 50th percentile or above) and a high school diploma was more likely to leave prematurely than an overweight recruit of less aptitude and educational quality. Attrition could have been reduced greatly had the more restrictive weight standards been utilized. On the other hand, adhering to these standards would have resulted in 15,396 fewer recruits in FY 1983. Because weight

standards were already stricter for females, females did not contribute to attrition under 120% of mean body-mass standards.

GENERAL ACCOUNTING OFFICE REPORTS

The following reports present suggestions for military improvement, specifically related to the reduction of attrition that were written by the GAO - General Accounting Office. The reports explain how attrition has become more of a problem in recent years and is more of a problem for women than men. They include recommendations for improving discharge policy and reducing attrition during the first six months of enlistment.

United States General Accounting Office. (1997). *Military attrition: DoD could save millions by better screening enlisted personnel* (GAO/NSIAD-97-39). Washington, DC: Gebicke, M. E. (AD A320 285)

United States General Accounting Office. (1997). *Military attrition: Better screening of enlisted personnel could save DoD millions of dollars* (GAO/NSIAD-97-120). Washington, DC: Gebicke, M.E. (ADA322476)

United States General Accounting Office. (1998). *Military attrition: DoD needs to better understand reasons for separation and improve recruiting systems- testimony* (GAO/NSIAD-98-109). Washington, DC: Gebicke, M.E.

United States General Accounting Office. (1998). *Military attrition: DoD needs to better analyze reasons for separation and improve recruiting systems- testimony* (GAO/NSIAD-98-117). Washington, DC: Gebicke, M.E.

United States General Accounting Office. (1998). *Military attrition: Better data, coupled with policy changes could help the services reduce early separations* (GAO/NSIAD-98-213). Washington, DC: Gebicke, M.E. (AD A354 034)

United States General Accounting Office. (1999). *Military attrition: DoD needs to follow through on actions initiated to reduce early separations- testimony* (GAO/T- NSIAD/-99-80). Washington, DC: Gebicke, M.E. (ADA360766)

The reports listed above refer to six testimonies given by M.E. Gebicke before Congressional Committees on the Armed Forces between 1997 and 1999. This series of reports represented responses to Congressional enquiries regarding the status of the AVF, and in particular, the issues which surrounding attrition, accession, retention, and consequent force readiness. The reports focused on the state of attrition and factors related to attrition. The testimonies also included recommendations for actions and strategies that DoD might implement to reduce attrition. The primary focus of the documents was on attrition during the first six months of the first-term of enlistment.

The following reports were published by GAO since 1980 and relate to military attrition.

United States General Accounting Office. (1980). *Attrition in the military- an issue needing management attention: Report to Congress* (GAO/FPCD-80-10). Washington, DC: United States General Accounting Office.

This report recommended that more concise criteria for discharge was needed, as discharges had become more common under the AVF. It also advocated a universal method of recording data in order to make comparisons across services possible. In addition, the report stated that there should be an efficient manner of designing and assessing programs and policies. Finally, the author of this report noted that attrition ceilings were arbitrary and should not be used as a means of keeping attrition rates down.

United States General Accounting Office. (1990). *Women in the military: Attrition and retention* (GAO/NSIAD-90-87BR). Washington, DC. The Honorable B. B. Byron, Chair, Subcommittee on Military Personnel and Compensation, Committee on Armed Services, House of Representatives.

This report provided data on attrition and retention of enlisted women as compared to enlisted men in the military. Attrition for women in the military services was found to be 4.5% higher than that for men. Most first-term attrition, for both men and women, happened in the first three months or the last three to six months of service. Between these periods, attrition in the first-term was steady for women and men. For each six month interval after the first and before the last six months men separated most often for misconduct, unsatisfactory performance, and/or drugs or alcohol abuse, while women most often separated due to pregnancy.

United States General Accounting Office. (2000). *Military personnel: First-term recruiting and attrition continue to require focused attention* (GAO/T-NSIAD-00-102). Washington, DC: N. Rabkin, Dir. National Security Preparedness Issues, Nat'l Sec. and Intnt'l Affairs Div.

This testimony recognized the recent trend of high attrition rates. Between those who entered the service (all services) in FY 1994 and left by the end of FY 1998, the DoD attrition rate was at an all time high of 36.9%, and the services were increasing their efforts to recruit and keep Soldiers. The author recommended that DoD make an effort to collect better data in order to be able to identify the real origin of attrition. In the first six months of service there were three predominating reasons for attrition: medical and physical problems, performance problems, and mistaken enlistments. DoD had already taken steps to resolve these problems, such as improving medical screening, background checks, and support for troubled recruits.

United States General Accounting Office. (2000). *Military personnel: Services need to assess efforts to meet recruiting goals and cut attrition* (GAO/NSIAD-00-146). Washington, DC: The Honorable T. Hutchinson and M. Cleland, Subcommittee on Personnel Committee on Armed Forces Committee, U.S. Senate

This report discussed both recruiting shortfalls and high attrition rates in the military services. When this report was written, attrition was at an historically high rate, despite recent actions that the services had taken to address the problem. For the cohort entering the military in 1985, the attrition rate was 29.6%. This rate increased to 36.9%

with the 1994 cohort. Most attrition was experienced during the first six months of enlistment and was attributed primarily to medical or physical problems, erroneous enlistment, and performance problems. DoD and the services had addressed these causes of attrition by improving medical screening, screening in general, and introducing remedial programs, in order to retain, rather than discharge, recruits. Better data were judged to be needed in order to identify the true causes of attrition and to assess whether actions taken to that point had been effective in addressing attrition in the long run, even as attrition remained at an all-time high.

RELATED RESEARCH

Theses and Dissertations

Baltzley, D.R. (1993). Organizational commitment: Comparing factor structures and prediction of turnover in civilian and military employees. *Dissertation Abstracts International*, 54, 10B.

Curtis, B.G. (1984). Predicting attrition under the Trainee Discharge Program for regular Army Soldiers in the Military Police School (Control Systems Theory). *Dissertation Abstracts International*, 45, 04B. (UMI No. 8415891)

Ellis, H. (1999). *A decomposition analysis of first-term attrition in the U.S. Military*. Unpublished master's thesis. Monterey, CA: Naval Postgraduate School.

Fultz, M.L. (1997). Predicting voluntary turnover: An application of the theory of planned behavior. *Dissertation Abstracts International*, 58, 04B.

Hale, T.M. (1990). Antecedent variables of military turnover. *Dissertation Abstracts International*, 51, 04A.

Lamerson, C.D. (1996). Peacekeeping stress: testing a model of organizational and personal outcomes. *Dissertation Abstracts International*, 57, 06B.

Lefroy, D.A.L. (1981). Differences on psychological measures related to military attrition. *Dissertation Abstracts International*, 42, 10B.

Martin, T.J. (1994). Who stays, who leaves? An analysis of first-term Army attrition. *Dissertation Abstracts International*, 55, 12B. (UMI No. 9509576)

Walker, M.R. (1999). The measurement and modeling of factors that affect personnel attrition within the U.S. Army. *Dissertation Abstracts International*, 60, 11B. (UMI No. 9948914)

Watson, P. (1994). The effects of neuroticism, agreeableness, conscientiousness, gender, and childhood abuse on attrition from military basic training. *Dissertation Abstracts International*, 55, 03B. (UMI No. 9421047)

Unpublished Papers and Conference Papers

Army Senior Leaders' Conference. (1998). *Recruiting, attrition, and retention*. Washington, DC: U.S. Department of the Army.

Babin, N.E. (2004). Soldier attrition as a process: A longitudinal analysis of attrition during the first term of enlistment. *Eastern Sociological Association*, March Washington, D.C.

Baldwin, Major R.H. Jr., Daula, Captain T., & Fagan, Major T. (1982). *As our policy maker's questions become more sophisticated, our research methods must match that sophistication: Some microdata evidence of enlistment, attrition and reenlistment*. Unpublished paper. West Point, NY: United States Military Academy.

Campbell. (1993). *Prediction of turnover in a longitudinal sample using event history analysis*. Symposium presented at the annual meeting of the American Psychological Association, Toronto, Canada.

General Officer Steering Committee. (1997). *First-term enlisted attrition*. Washington, DC: Director of Military Personnel Management, Deputy Chief of Staff for Personnel, U.S. Army.

Gilroy, C.L. & Sellman, W.S. (1994). *Recruiting and sustaining a quality army: A review of the evidence*. In R.L. Phillips and M.R. Thurman (Eds.), *Future Soldiers and the quality imperative: The Army 2010 Conference*. Cantigny, IL.

Kubisiak, U.C., Lentz, E., Connell, P.W., Tuttle, M., Horgen, K.E., Borman, W.C., et al. (2005). *Review of interventions for reducing enlisted attrition in the U.S. Military-draft report* (Technical Report). Tampa, FL: Personnel Decisions Research Institutes, Inc.

Laurence, J. H. (1997, August). *Does education credential still predict attrition?* Paper presented at the 105th Annual Convention of the American Psychological Association, Chicago.

McCloy, R.A., DiFazio, A.S., & Carter, G.W. (1993). *Prediction of first-term military attrition using pre-enlistment predictors*. Paper presented at the meeting of the American Psychological Association, Toronto, Canada.

Salo, M., & Siebold, G. (2005). *Predictors of attrition in the Finnish Conscript Service*. Prepared for the 45th Biennial International Conference of the Inter-University Seminar on Armed Forces and Society, Chicago, IL.

Siebold, G.L. (1981). *Attrition: Causality, Explanation, and Level of Analysis*. Paper presented at the Proceedings of the Twenty-Third annual Conference of the Military testing Association, Arlington, VA.

Tremble, T. R., Strickland, W. J., & Sipes, D. E. (2000). *Project first term: A longitudinal investigation of attrition and retention of first-term Soldiers in the U.S. Army*. Paper presented at the International Workshop on Military Recruitment and Retention in the 21st Century, The Hague, The Netherlands.

White, L.A., Young, M.C., Heggestad, E.D., Stark, S., Drasgow, F, & Piskator, M.G. (2004). *Development of a non-high school diploma graduate pre-enlistment screening model to enhance the future force*. Paper presented at the 24th Army Science Conference Proceedings, Orlando, FL.

ACRONYMS AND DEFINITIONS, AS USED IN REFERENCES¹

AARCRT:	Active Army Recruit Database
ACES:	Army Continuing Education System
ACF:	Army College Fund
AFCT:	Armed Forces Classification Test
AFQT:	Armed Forces Qualification Test
AFRP:	Army Family Research Program
AIM:	Assessment of Individual Motivation
AIT:	Advanced Individual Training
APFTEP:	Army Physical Fitness Test Enhancement Program
ASAP:	Armed Services Applicant Profile
ASVAB:	Armed Services Vocational Aptitude Battery
ATRRS:	Army Training Reporting Record System
ATSC:	Army Training Support Center
AVF:	All-Volunteer Force
BCT:	Basic Combat Training
BMT:	Basic Military Training
CONUS:	Continental United States
DA:	Department of the Army
DEP:	Delayed Entry Program
DLIFLC:	Defense Language Institute Foreign Language Center
DMDC:	Defense Manpower Data Center
DoD:	Department of Defense
EMF:	Enlisted Master File
EPAS:	Enlisted Personnel Allocation System
EPSQ:	Electronic Personnel Security Questionnaires
FAST:	Functional Academic Skills Training
FTA:	The First Tour Attrition
FY:	Fiscal Year
GAO:	General Accounting Office
GED:	General Equivalency Diploma
GI Bill:	Veteran's Benefits Act, Public Law 345, 1944
GM:	General Maintenance
GT:	General Technical
ICD-9:	<i>Ninth Revision of the International Classification of Diseases</i> (a publication)
IET:	Initial Entry Training
ISC:	Inter-service Separation Code
MAP:	Military Applicant Profile
MEPCOM:	Military Enlistment Processing Command

¹ Source: Mossman, J. (Ed.). (1990). *Acronyms, Initialisms, & Abbreviations Dictionary* (Vol.1). Detroit, MI: Gale Research, Inc.

MILPERCEN:	Military Personnel Center
MK:	Mathematics Knowledge
MM:	Mechanical Maintenance

MOS:	Military Occupational Specialty
MOSIT:	Military Occupational Specialty Improvement Training
NCO:	Noncommissioned Officer
ODCSPER:	Office of the Deputy Chief of Staff for Personnel
OID:	Organizational Identification
OPTEMPO:	The intensity and number of operations
ORMF:	Operational Recruiter Master File
PERSTEMPO:	Personnel Tempo
PTRP:	Physical Training and Rehabilitation Program
SF:	Special Forces
SFQC:	Special Forces Qualification Course
SOMED:	Special Operations Medicals Sergeants Course
ST:	Skilled Technical
TA:	Tuition Assistance
TDP:	Trainee Discharge Program
USAFAC:	United States Army Finance Accounting Center
USAREC:	United States Army Recruiting Command
USAREUR:	United States Army, Europe